An Evaluation of the Massachusetts Compliance Assurance Demonstration Grant

by

The Massachusetts Department of Environmental Protection

Bureau of Waste Prevention

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EXECUTIVE SUMMARY

Introduction

During federal fiscal years 1995 and 1996 (from October 1, 1995 through September 30, 1996), the Massachusetts Department of Environmental Protection's Bureau of Waste Prevention (BWP) and the U.S. Environmental Protection Agency (EPA) - New England entered into one of three Demonstration Grants authorized in the U.S. The Massachusetts Compliance Assurance Demonstration Grant was unique in that it tested several aspects of the State-EPA relationship, and innovative ways of providing environmental protection. The primary activities tested under the Demo Grant were:

- multimedia compliance inspections performed by single inspectors (rather than by cross-media teams of inspectors);
- flexible targeting of industrial facilities based upon joint State-EPA priorities;
- combining financial portions of three federal grants: the Clean Air Act (105) grant, the Resource Conservation and Recovery Act (RCRA) grant, and the National Pollutant Discharge Elimination System (NPDES 106) grant for industrial wastewater sources;
- building an innovative electronic data system (the Facility Master File [FMF]) to improve BWP's multimedia facility compliance and enforcement tracking and for reporting to EPA and others; and
- using innovative regulatory techniques including statistical inspection targeting within industry sectors, extensive use of compliance assistance (involving partnering with other state agencies including the Massachusetts Office of Technical Assistance), industrial self-certification of compliance, and a bias toward pollution prevention as the preferred means of achieving or exceeding regulatory compliance.

While DEP and EPA were both aware of the ultimate necessity of evaluating activities which BWP had undertaken during the Demo Grant period, a formal set of evaluation questions was not jointly negotiated until March 1996. This document attempts to provide answers to those questions and to present other material discovered to be relevant during the evaluation process. The questions and interests this document attempts to answer (reproduced exactly as negotiated with EPA-New England) are:

- Is the FIRST protocol (BWP's multimedia Facility-wide Inspection to Reduce the Source of Toxics [Waste Prevention FIRST]) and DEP's use thereof discovering significant environmental problems?
- Is the FIRST protocol and DEP's use thereof sufficient to support enforcement cases?
- Is flexible inspection targeting as effective as, or more effective than traditional targeting?

- Are statistical targeting approaches successful in demonstrating compliance and noncompliance?
- have DEP's activities improved industry's efforts in waste reduction or pollution prevention?
- Do compliance assistance projects achieve compliance?
- Is multimedia targeting and inspection resource-efficient?
- Has DEP's accomplishment reporting to EPA improved?
- How are Measures of Success working?
- Discussion of waste-stream based [inspection] targeting.
- Analysis of complaints and tips [received from public].
- Status of Massachusetts Environmental Leadership Program.

Summary of Findings

The following list briefly presents the findings of this evaluation. More detail is presented in the ensuing chapters.

- The FIRST protocol provides opportunities for discovering significant violations, and supports enforcement actions based upon inspection findings. For example, many FIRST inspections result in discovery of unregistered, unpermitted or unlicensed activities. Additionally, the multimedia approach allows for elevating the level of enforcement action in consideration of multiple violations in more than one waste medium program. A follow-up inspection for purposes of further building an enforcement case is required for a minority of facilities, and is initiated at the request of the FIRST inspector. No enforcement actions have required multiple inspections because the initial FIRST inspection failed to obtain all useful information.
- Flexible targeting has resulted in finding significant rates of noncompliance, particularly in smaller sources, or newly-regulated sources. "Major" air and hazardous waste sources are still represented as about 10% of the inspection pool, despite not being explicitly targeted at that rate. DEP therefore concludes that flexible targeting is an effective way to measure and affect the behavior of additional regulated sources without sacrificing compliance assurance at larger, traditionally inspected facilities.
- Statistical targeting approaches are extremely effective in providing a "snapshot" of an industry's compliance rate and other environmental behaviors. DEP will continue to rely on this method for evaluating industry compliance and regulatory program effectiveness in sectors involving several hundred to a few thousand sources.
- DEP's compliance and enforcement efforts at improving pollution prevention in Massachusetts are difficult to measure. While the Toxics Use Reduction Act has provided a highly effective statutory basis for requiring P2 planning at the largest users of toxic and hazardous chemicals, obtaining progress at other facilities has been difficult to accomplish, and even more difficult to measure effectively. Early data, however, are extremely encouraging and

inspire DEP to continue exploring more effective ways to promote pollution prevention.

- Compliance assistance is an effective tool for achieving compliance, but DEP has discovered that different sectors may require quite different approaches, and the content to be conveyed must be carefully designed in order to achieve the greatest effectiveness. Fore example, fuel dispensers are a difficult industry to educate effectively about sophisticated environmental regulatory requirements, partly due to the very small size of most of the businesses, and due to the transient nature of business ownership. Printers were somewhat easier to affect, but specific types of information were conveyed to a lesser or greater extent due to more generalized versus more specific statements.
- DEP has determined that resource usage is not inappropriate to the level of effort expected for a multimedia inspection. For each facility, 5 waste medium program areas are considered. Analysis of timesheet data shows an average of 34 hours per facility inspection, including file review, pre-inspection coordination, field inspection, completion of documentation, and data entry.
- To support the multimedia approach to inspection and enforcement, BWP designed and constructed a multimedia data system called the Facility Master File (FMF). As with any data system startup, difficulties were encountered in entering complete and correct data, and in obtaining complete and correct reports. At the same time, BWP was also reporting compliance and enforcement accomplishments to three national data systems maintained by EPA using three different reporting methods. Significant reporting and reconciliation difficulties were encountered, which continue to be addressed.
- Concurrent with other state, regional, and national efforts to develop environmental indicators, BWP developed a package of Alternative Measures of Success (MOS), metrics which would complement compliance and enforcement outputs (such as the number of facilities inspected) with compliance and enforcement outcomes (such as number and quantity of illegal waste streams controlled through compliance and enforcement or permitting efforts). These measures proved very difficult to implement, requiring inspectors or permitters to obtain data or estimate items which had previously not been required. Similarly, enhancing FMF to accurately track MOS data was a very large undertaking. In light of these difficulties and without dedicated resources, BWP postponed further development of MOS and will likely continue this work in FY98.

The Compliance Assurance Demonstration Grant set the stage, in a large way, for the Performance Partnership Grant and Performance Partnership Agreement recently negotiated between Massachusetts and EPA-New England. DEP is also aware of the national attention to outcomes of the Demo Grant, and has tried to address those needs in this document as well. DEP has received inquiries or is aware of attention from the United States Congress, the Congressional General Accounting Office, the U.S. EPA-Headquarters, and the U.S. EPA Inspector General, among others.

We hope that this document serves to answer most questions. If not, we are happy to discuss any of our projects or findings.

Carl F. Dierker
Assistant Commissioner,
Bureau of Waste Prevention

April 1997

1. Compliance and Enforcement Self-Assessment

The Compliance Assurance Demonstration Grant entered into between EPA-New England and Massachusetts DEP during federal fiscal years 1995 and 1996 served as a fore-runner to the performance partnership grant and agreement currently in place. The Demonstration Grant paved the way by including aspects of performance flexibility and grant consolidation.

As part of the federal fiscal year 1997 performance partnership activities, BWP re-examined its compliance and enforcement philosophies, practices, and tracking systems both from an historical perspective and in the context of ongoing regulatory developments. DEP Commissioner David Struhs has made enforcement of environmental regulations a very high agency priority since his arrival in May 1995.

This compliance and enforcement self-assessment not only presents a status report on recent activity but discusses innovations being introduced now and what they are likely to mean for the future.

1.1 The Compliance Assurance Demonstration Grant

During federal fiscal years 1995 and 1996 (FY95 and FY96, from October 1, 1994 through September 30, 1996), BWP pursued federal grant flexibility by negotiating the Compliance Assurance Demonstration Grant. The funding for compliance and enforcement activities was removed from the federal Clean Air Act and Amendments (air 105), Resource Conservation and Recovery Act (RCRA) and National Pollution Discharge Elimination System (NPDES 106, portions concerning industrial wastewater control) grants and combined into a single, fourth grant, the Compliance Assurance Demonstration Grant. Similarly, compliance and enforcement activities were stripped out of the three traditional grants, and were renegotiated and placed into the new grant. This helped DEP to achieve increased flexibility in targeting compliance and enforcement commitments to provide a more integrated multimedia outcome.

More detail on the nature of these activities and evaluations of DEP's implementation of them is presented throughout this report.

1.2 Massachusetts Department of Environmental Protection

The Massachusetts Department of Environmental Protection (DEP) is one agency located in the Massachusetts Executive Office of Environmental Affairs (EOEA), and is divided into several functional offices and bureaus. The Office of Operations and Programs is divided organizationally into three bureaus:

- Bureau of Waste Site Cleanup -- dealing with remediation of contaminated sites and emergency response to spills of hazardous materials
- Bureau of Resource Protection -- dealing with wetlands, waterways, coastal waters, watersheds, and controls on drinking water systems, sewage treatment systems, and septic systems
- Bureau of Waste Prevention -- dealing with controls on industrial, manufacturing, and commercial sources or potential sources of pollution.

Structurally, DEP is divided into 5 major offices, a Boston headquarters and four Regional Offices. Boston is generally responsible for writing regulations and guidance, setting policy, and evaluating performance; the Regional Offices are responsible for operations. Boston and the Regional Offices work closely together, and each participates in the responsibilities of the other.

During the two years of the Compliance Assurance Demonstration Grant, the Bureau of Waste Prevention was undergoing an organizational transition. BWP staff in the Boston headquarters office remained divided into traditional regulatory program areas: air quality, industrial wastewater, solid waste management, hazardous waste management, and Toxics Use Reduction (TUR) with the addition of the Office of Program Integration, a staff of several "functional area" coordinators who oversaw part-time, matrix-management staff from each program. OPI personnel included coordinators for program planning and evaluation; regulatory and policy development; permitting; compliance and enforcement (C/E); and training. Meanwhile, staff in the Regional Offices were reorganized from a structure following the traditional program areas to one following multimedia functional areas. Thus, each BWP unit in the four Regional Offices became comprised of one Regional Engineer (reporting to the Regional Director), a Compliance and Enforcement Chief and multimedia field staff, and a Permitting Chief and staff. Monthly meetings were organized by the OPI C/E Coordinator and Permitting Coordinator with the regional C/E Chiefs and Permitting Chiefs, respectively, to improve coordination between BWP-Boston and BWP in the Regional Offices. Weekly meetings were organized by the OPI coordinators with their matrix-management teams of Boston programmatic staff to improve coordination among the traditional program areas, and to instill and encourage pollution prevention concepts in the development of regulations, policies, and guidance documents.

1.3 Multimedia Inspection Approach

On an annual basis, BWP inspects about 1,000 industrial facilities (following the multimedia Waste Prevention FIRST Protocol "B"), more than 1,000 asbestos abatement jobs and more than 200 solid waste management facilities (such as landfills and transfer stations). The FIRST inspection protocol was jointly

developed by DEP and EPA-New England staff, and has been in use at industrial facilities across Massachusetts since 1993. Features of a FIRST inspection include:

- inspection for regulatory compliance

- three areas of joint federal and state regulation:
  1. hazardous waste (Resource Conservation and Recovery [RCRA] regulations),
  2. air quality (Clean Air Act and Amendments regulations, and
  3. industrial wastewater (a portion of the National Pollution Discharge Elimination System [NPDES] regulations)

- two areas of state regulation:
  1. solid waste disposal regulations
  2. Toxics Use Reduction Act (TURA) regulations

- process-based; follows material flow through the facility

- pollution prevention opportunities identified; violators and compliant facilities encouraged (not required) to avail themselves of technical assistance and to implement projects

- typically perfomed by a single inspector (not a team of single-medium inspectors)

Note that DEP uses the approach of training a single inspector to perform the multimedia compliance evaluation inspection, rather than a team of single-medium inspectors. This aspect of innovation will be discussed later in this report.

1.4 Innovative Inspection Targeting ("Flexible Targeting")

Traditionally, the guidance that accompanied federal funds drove BWP to target most of its industrial inspections at the largest sources of pollution (known as "major" or "national priority" sources in each waste program). In recent years, through grant negotiations with EPA, BWP has increasingly used innovative, flexible schemes for targeting inspections at industrial facilities. Current practices seek to target:

- Activities carrying high risk to public health or sensitive ecosystems, should non-compliance occur (e.g. hazardous waste treatment, storage and disposal);

- Sectors with historically high rates of noncompliance, the potential for environmental harm from noncompliance or environmental gains through pollution prevention, or a tendency to seek competitive advantages by avoiding compliance costs;

- Industries for which new regulatory or policy requirements have recently been established;

- "Outlaws" and "Scofflaws" (i.e. facilities unknown to any of BWP's programs or holding permits or registrations from some but not others);

- "Bad Actors" (i.e. specific facilities with a history of noncompliance); and

- State-owned or state-run facilities (per Governor Weld's "Clean State" Executive Order 350).

It is worth noting that while these innovative targeting categories may not have explicitly included traditional EPA priorities such as hazardous waste Large Quantity Generators (LQGs) or air quality "major" sources, BWP has found that its approach tends to encompass them anyway. During FFY95 and FFY96, for example, LQGs and all air "majors" were not specifically targeted, but about 20% of the total number of LQGs and about 33% of the total number of air "majors" in the state were inspected each year. Further detail on the performance of this approach follow later in this report.

1.5 Pollution Prevention Orientation

BWP designed its industrial inspection protocol to include both an examination of facility processes for pollution prevention opportunities and a discussion of the potential for pollution prevention during on-site interviews, in documentation of inspections, and as part of enforcement actions. In contrast, other environmental agencies generally perform pollution prevention, source reduction or waste minimization projects in isolation from compliance and enforcement.

DEP anticipates finalizing an enforcement policy covering supplemental environmental projects (SEPs), including pollution prevention projects, which is discussed later in this document.

1.6 Enforcement Audits

Three separate entities audited DEP and BWP enforcement activities in 1993. EPA-New England and the Massachusetts Attorney General's Office both audited DEP and an internal DEP audit examined BWP's enforcement activities.

All three audits found an over-reliance on the Notice of Noncompliance (NON), DEP's lowest level of enforcement and one that carries no monetary penalty. (Note that DEP's administrative penalty statute generally allows the agency to assess financial penalties only after issuance of Notices of Noncompliance (NONs) unless there is evidence of significant actual or potential environmental impact and/or willful action to violate environmental laws.)

1.7 Enforcement Improvements

Spurred by these audits and other factors, DEP is paying increased attention to many aspects of managing its compliance and enforcement effort. Among the improvements undertaken recently:

- Regional Enforcement Review Committees (RERCs) and an agency-wide Case Screening Committee (CSC) were established to provide for upper management input and improved consistency in determining the outcomes of enforcement actions which may involve monetary penalties.

- DEP's Office of General Counsel reassigned attorneys to provide a better presence in the agency's four regional offices and encouraged regional compliance and enforcement staff to make use of these new legal resources.

- New enforcement tools such as the field notice of noncompliance (FNON) and the expedited penalty assessment notice (ExPAN) have been, or are currently being, developed to allow on-the-spot citation of specific clear-cut, lower-level violations.

- BWP programs including those affecting commercial printers, Stage II fuel dispensers, companies subject to the Toxics Use Reduction Act and other regulated facilities have made enforcement strategy planning a routine piece of regulatory development and have issued new enforcement guidance.

- The Commissioner and BWP have made improved compliance and enforcement one of the agency's top five priorities and BWP held an all-staff retreat to discuss enforcement improvements and recognize staff who have performed well in this area.

- Annual targeting of compliance and enforcement initiatives and ongoing selection of particular companies to inspect within those initiatives includes a conscious consideration of enforcement

priorities. BWP targets risks to public health and the environment, and to locate "outlaws" and "scofflaws".

- A multimedia, compliance and enforcement staff were created by BWP to serve as a single point of coordination for program planning and implementation, a single point of contact for EPA, and to track various multimedia compliance and enforcement accomplishments.

- An expanded multimedia enforcement and audit unit, to be headed by a Deputy Division Director within the Business Compliance Division, is being formalized as part of BWP's overall reorganization. This will give more focus and higher priority to industrial enforcement issues and will parallel BWP regional office structure.

- BWP's multimedia Waste Prevention FIRST Protocol "B" was implemented. DEP and EPA worked jointly to develop this multimedia inspection protocol as a single, organized guidance document. BWP then piloted its use and subsequently trained all industrial facility inspectors, for whom it is now the standard approach statewide.

- During the two-year period of the Compliance Assurance Demonstration Grant, BWP identified data tracking needs, developed a multimedia compliance and enforcement tracking database, and refined the use of that system. Much work remains before the accomplishment reporting and data compatibility expectations of EPA and DEP can be met, but progress to date has been significant.

- DEP's Office of Enforcement prepared written guidance and conducted training for all DEP inspection and enforcement staff.

- DEP's Deputy Commissioner for Operations and Programs launched a Total Quality Management (TQM) project to determine what was causing problems in the conduct and tracking of enforcement activities. Preliminary solutions are being developed and implemented now.

1.8 Future Goals

1.8.1 Continued Management Attention and Support

BWP will increase management attention to, and support of, compliance and enforcement activities and continue taking them into consideration as a routine part of overall program planning. BWP also will work toward better data tracking and quality. For example, in addition to the traditional "bean" counts (i.e. numbers of inspections conducted, enforcement actions taken, etc.), BWP will continue to be active in developing and refining alternative measures of success (e.g. amount of leachate avoided by capping landfills, volume of illegal wastewater discharge terminated through permitting, etc.) and environmental indicators (e.g. measurements of ground-level ozone, contaminated fish tissue, etc.).

BWP will continue to make use of innovative enforcement policies and tools that exist today or emerge in the future. For example, DEP will soon issue policies improving statewide enforcement consistency for cases involving municipalities, small businesses, facilities conducting self-audits, and facilities proposing supplemental environmental projects (SEPs).

DEP will soon be issuing additional enforcement guidance to help staff better analyze violations and determine when higher-level enforcement, including penalties, is warranted. Future enforcement tools include coupling field notices of noncompliance with expedited penalty assessment notices (ExPANs) similar to traffic tickets providing on-the-spot penalties for smaller violations, as well as revisions to DEP's penalty "base numbers" to provide improved consistency across all programs.

1.8.2 Strategic Enforcement Planning

BWP will continue to test and use a variety of strategies to achieve environmental protection. Recognizing that the ultimate success of its efforts will depend, in part, on how skillful it can be at achieving the proper balance of

- **P**ermitting (as well as certification, registration, licensing, etc.),
- **A**ssistance (workbooks, clinics, hotlines, etc.),
- **C**ompliance assessment (inspections, report reviews, audits, etc.),
- **E**nforcement,

DEP is using the acronym **PACE** to articulate its guiding principles. Each component of PACE will be applied with respect to the unique goals of specific

programs and initiatives, and the balance of the components will change over time, as those programs evolve, goals are met, and more aggressive objectives are established.

Specifically, BWP intends to continue its inspections of both large and small industrial pollution sources. For large universes of smaller sources that tend to have higher rates of noncompliance and fewer resources, BWP will continue to use strategies such as:

- Intensive compliance assistance efforts followed by swift, sure and publicized enforcement;

- Use of enforcement forbearance to encourage rapid sector-wide compliance, again followed by a well-publicized enforcement campaign; and

- Targeting facility inspections through statistical, random sampling as a before-and-after test of pilot program design prior to full implementation.

For large industrial pollution sources that tend to have greater public health and environmental impacts when non-compliance occurs, BWP will follow its now-standard approach, including:

- Inspection of a substantial percentage of the universe of sources at regular intervals; and

- The likelihood that higher-level enforcement actions, including penalty assessments, will increase as a proportion of all inspections conducted.

Across all programs, enforcement will be used increasingly as a deterrent to would-be scofflaws, as well as a tool for recouping the unfair profits gained by willful violators and punishing them for the damage they have done.

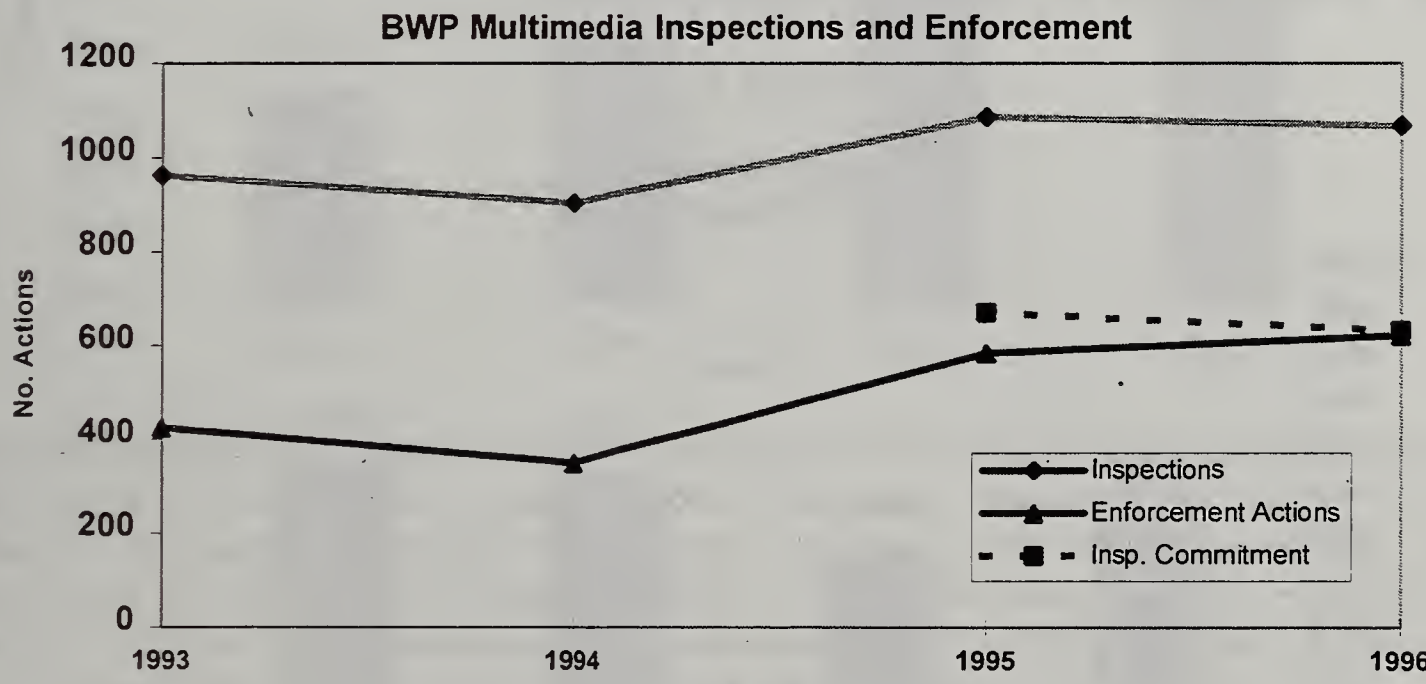
Finally, BWP intends to improve upon its innovative, flexible targeting strategies for multimedia inspections of industrial facilities; single-medium inspections in the areas of solid waste management and asbestos abatement projects; and pollution prevention-biased compliance and enforcement activities wherever possible.

2. Inspection and Enforcement Trends and Analysis

2.1 Inspections: 1993-1996

The Massachusetts DEP Bureau of Waste Prevention (BWP) implemented multimedia inspections in all regions on a limited scale in 1992, and full scale in 1993. The number of multimedia inspections performed by BWP has remained at about 1,000 facilities per year (Exhibit 2-1). For 1995 and 1996, the number of multimedia inspections committed to by BWP was about 650; BWP exceeded its commitment by about 54% annually.

Exhibit 2-1[1]



The bureau's transition to its new electronic data tracking system, the Facility Master File (FMF) has occurred with difficulty, and redundant systems for data checking also contain some inconsistencies. As a result, the number of multimedia facility inspections in a given year should be considered a highly reliable estimate; the totals and trends shown have been confirmed by field staff and by redundant data systems within about 85% percent accuracy.

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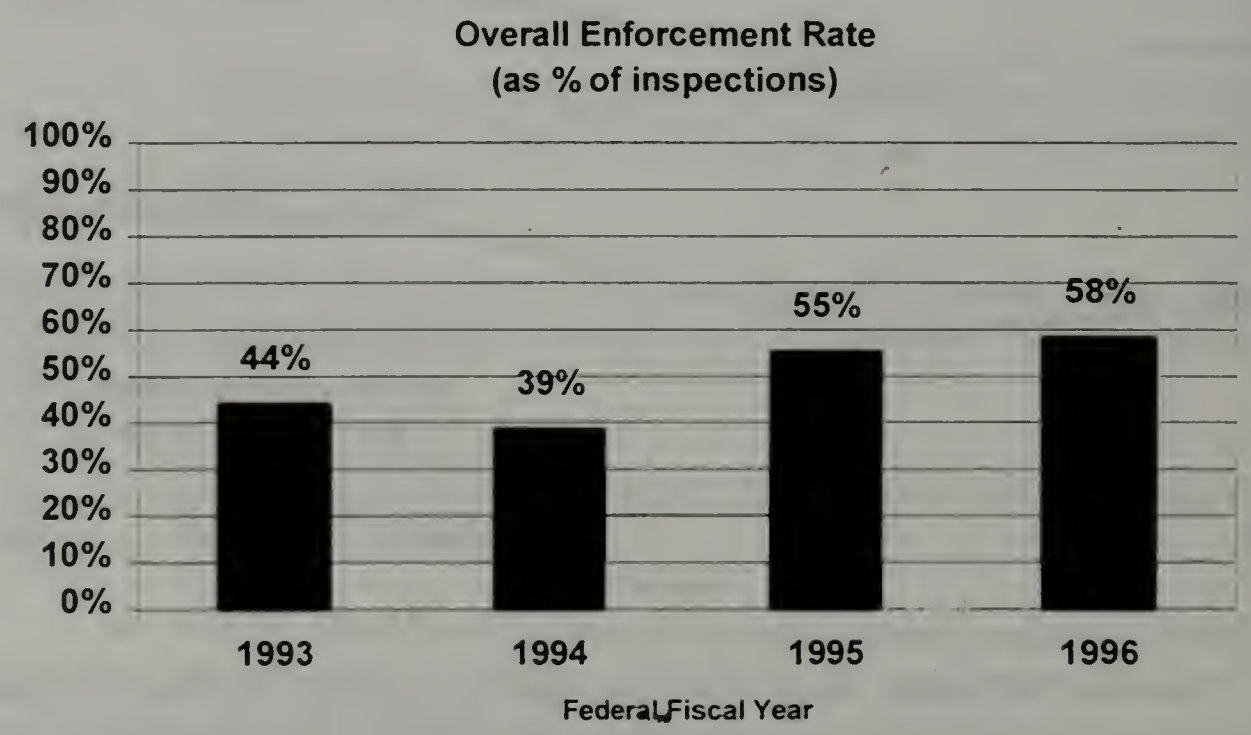
[1] Data are originally from BWP's Facility Master File (FMF). For FY93, the source was "Non-Compliance Rates at DEP FY93 Federal Grant and State Initiative Inspections" from BWP OPI file "FY94 Compliance Rate Analysis". Data were missing for one of the regions, WERO; WERO's contribution was calculated at 11%. For FY94, the source was "State-wide Non-Compliance Rates at FY94 FIRST Inspections 10/1/93-9/30/94" from BWP OPI file "FY94 Compliance Rate Analysis". Furthermore, it is unclear what percentage of inspections for 1993 and 1994 were single medium vs. multimedia inspections. 1995 and 1996 numbers are more accurate because of improved tracking and reporting, and nearly 100% of inspections were multimedia.

2.2 Enforcement Rates: 1993-1996

Following statewide institutionalization of the multimedia inspection approach combined with initially-limited inspection targeting flexibility in FY93 and FY94, the enforcement rate has been rising yearly from a percentage in the low 40s to a percentage in the high 50s (Exhibit 2-2). The question of whether a rising enforcement rate is good or bad is open to interpretation. BWP believes the rising enforcement rate reflects better targeting and/or better inspections rather than a bleaker environmental picture. Enforcement rates among facilities that have been visited for several years have been dwindling while higher violation rates are found among newly inspected facilities, newly targeted industry sectors, and facilities subject to new or modified regulations, for example. These findings are detailed in the next section.

Exhibit 2-2

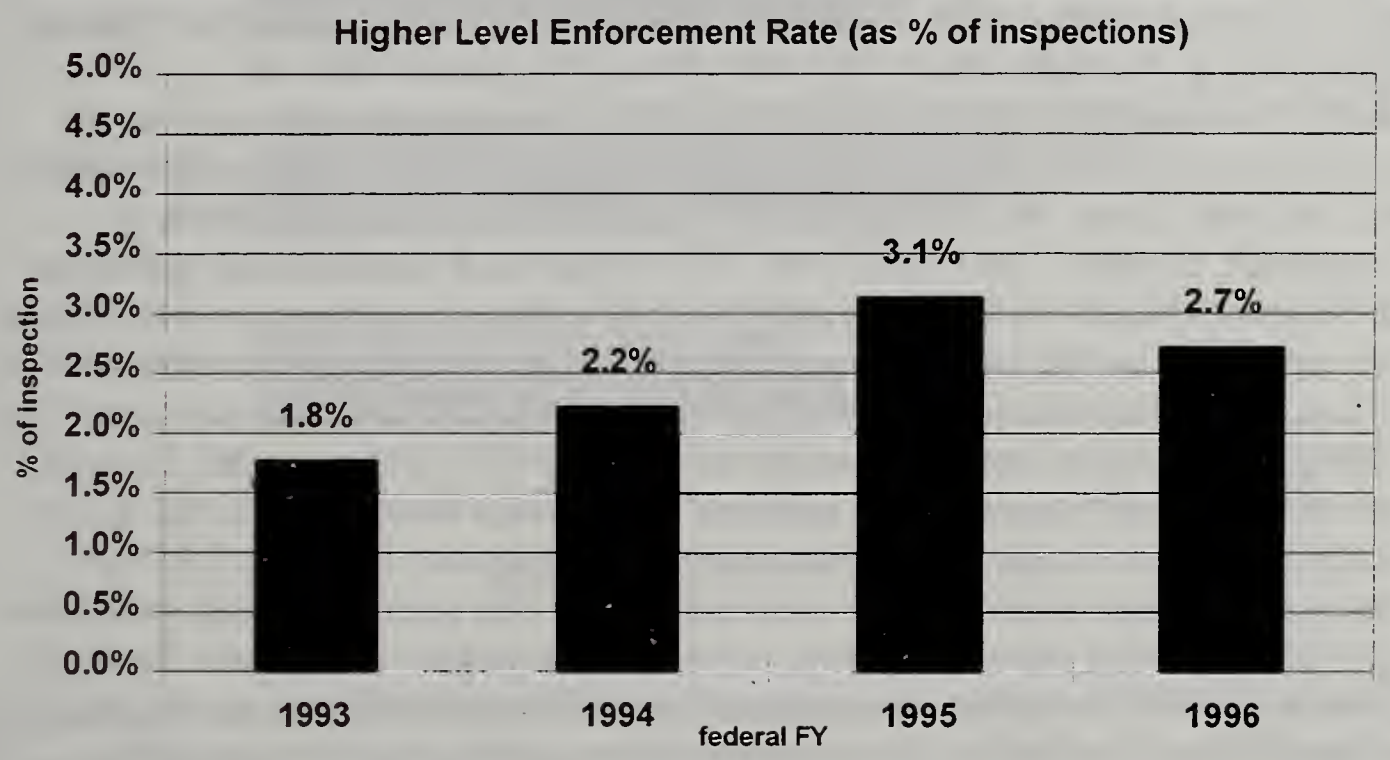


The rate of higher level enforcement actions[2] has also generally increased over the period (Exhibit 2-3). The increasing number reflects a growing rate of detection of more serious environmental problems and/or an elevation in status of violations at facilities with a history of noncompliance, that is, violations with imminent threat or actual harm to public health or the environment, and/or repeated violations previously discovered at a facility which now warrant an increased enforcement response. The decreased number of higher level enforcement actions in FY96 may be due to a decrease in higher level enforcement in a particular initiative (history of noncompliance) combined with two initiatives which either did not yield any higher level enforcement, or showed a

[2] A "higher level enforcement action" is defined as any enforcement action stricter than a "Notice of Noncompliance" (NON). Higher level enforcements include Administrative Consent Orders with or without a penalty (ACOs and ACOPs), Penalty Assessment Notices (PANs), and Unilateral Administrative Orders (UAOs), in addition to referrals to the U.S. EPA or to the Massachusetts Attorney General for civil or criminal prosecution.

decreased rate from FY95 (printers and unsewered areas, respectively). These initiatives and others will be discussed in more detail in the following sections.

Exhibit 2-3



One possible explanation for the generally rising rate of higher level enforcements is the action DEP initiated in response to the EPA report, "Final Multi-Media Overview Report on Massachusetts DEP Enforcement", January 1994, which highlighted issues and areas for improvement relating to higher level enforcement. This, in conjunction with an audit of DEP enforcement by the Massachusetts Attorney General's office, and an internal DEP enforcement audit, resulted in similar conclusions about staff performance and needs. As a result, BWP conducted enforcement training for all inspectors that year. It is also widely believed that more thoughtful targeting is driving the rate up. Note that the enforcement rate numbers suggest the efficacy of the FIRST Protocol B at finding environmental problems.

2.3 Flexible Targeting

2.3.1 What is Flexible Targeting?

Much of the funding for BWP inspection activity is provided by the federal government. This funding comes with constraints and priorities set by EPA. Prior to FY93, the particular facilities that DEP inspected had been largely mandated by EPA. It was difficult in past years for BWP field staff to find time to inspect any facilities other than those required by EPA. EPA's priorities included "major" sources (those facilities holding federal permits whose actual or potential generation rates classify them as major sources of pollution) which, if noncompliant, presumably would pose great environmental threat. As a result, due to the resource constraints always experienced

by public agencies, many of the same facilities were inspected every year for many years while thousands of other facilities were never inspected.

Meanwhile, BWP suspected that new and/or smaller facilities never inspected were more likely to be noncompliant than the larger facilities they visited every year, based on preliminary data and professional judgment. Since more than 80% of Massachusetts' businesses have fewer than 10 full time employees, the number of facilities which were not being inspected was very large (estimated at about 18,000 companies). In order to test the theory, DEP negotiated with EPA for flexibility in choosing inspection targets. For FY93-FY94, DEP received a consolidated grant that relaxed the targeting requirements somewhat. Inspections were still separately funded according to regulatory waste media program (water, air, and hazardous waste), but within each program, "discretionary" as well as "priority" inspections were planned. The particular designated "priority sources" would be listed by EPA and generally included known major sources; the "discretionary sources" were major sources selected solely by DEP. Additional, state-funded inspections were also targeted solely by DEP and were not necessarily major sources. For example, using this approach, major facilities with one year of monitoring reports showing consistent compliance and were found to be in compliance in FY93 would not be inspected in FY94; and facilities not required to self report compliance information which also had three years of good compliance records would not be inspected in FY94[3]. Both of these initiatives fell into the "discretionary" category.

Initial results supported the hypothesis that inspecting the EPA priority sources every year to the exclusion of other sources resulted in missing noncompliant facilities. The rate and severity of noncompliance found at the major sources was lower than that at smaller, less frequently inspected sources. In FY93, enforcement actions among priority inspections were only 31% compared to 52% at discretionary sources and 42% at state-funded inspections. In FY94, enforcement actions among priority sources totaled 34% compared to 41% at discretionary sources and 37% at state inspections (Exhibit 2-4).

The following year, DEP negotiated for greater targeting flexibility and received the FY95-96 Compliance Assurance Demonstration Grant. The grant also allowed DEP to fully pursue the multimedia inspection approach by combining all regulatory program waste media funding and creating inspection categories delinked from individual media programs. The results of the grant further substantiate the approach and are detailed in the following sections.

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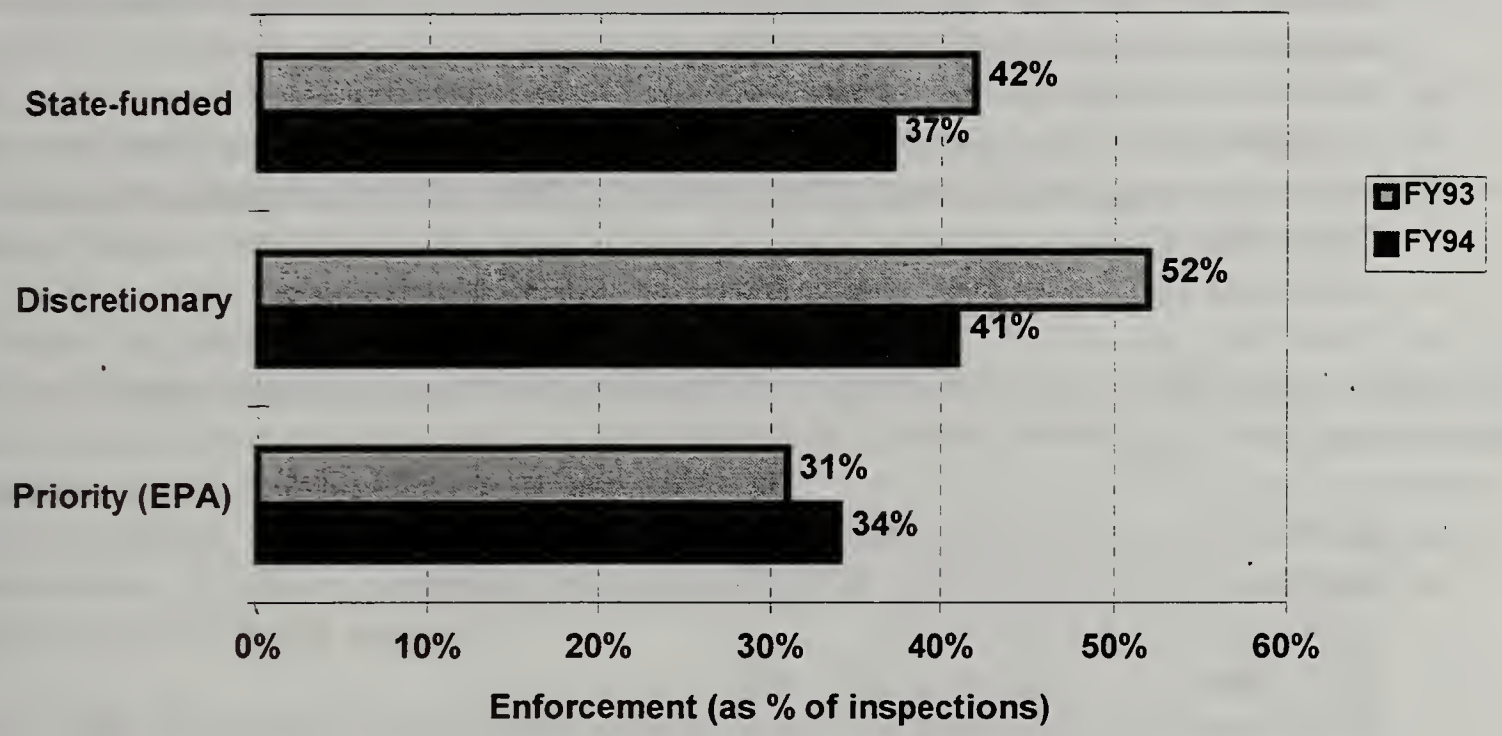
[3] FY94 Federal Grants for Compliance and Enforcement, MaDEP-BWP, p 2.

Exhibit 2-4



The experience of DEP field staff provides additional support for the success of flexible targeting. Several reported in interviews that the majority of larger and/or older industrial sources, mainly EPA priority sources, are in compliance.[4] An interview with an Environmental Strike Force (ESF - an inspection unit within DEP which conducts investigations of suspected illegal activities for referral to the Massachusetts Attorney General for civil or criminal prosecution) inspector yielded the following: in general, big companies are more likely to be in compliance than small ones. Generally the complaints that ESF receives are concentrated among small facilities, for example, auto body shops.

2.3.2 How are Targets Chosen?

Using the flexible targeting approach, factors considered in selecting facilities under the Compliance Assurance Demonstration Grant included:

- industrial sectors posing environmental risk and the likelihood of high rates of noncompliance within the sector (including those with sector-wide unfulfilled pollution prevention opportunities)
- geographical sensitivity (e.g., watersheds; sensitive ecosystems such as wetlands)
- public health (e.g., facilities in unsewered areas where a public water supply exists)

[4] All references to "inspector interviews" refer to comments from inspectors interviewed by BWP OPI program evaluation team in summer 1996.

- quantity and/or toxicity of substances managed or emitted (e.g., hazardous waste treatment, storage, and disposal facilities; large quantity toxics users; largest manufacturing facilities; utilities)
- environmental justice (e.g., "brownfields")
- priorities of the Governor, the Secretary of Environmental Affairs, EPA, or DEP (e.g., state facility inspections under EO350; EPA priority sources; new DEP regulations)
- individual facilities with a history or high risk of noncompliance

Beginning in 1994, BWP has increasingly solicited input for these decisions and annually requests suggestions for new initiatives from:

- BWP regional field operations staff
- headquarters program staff in BWP and other Bureaus
- DEP Office of Enforcement
- DEP Office of the General Counsel
- DEP Commissioner's office
- Massachusetts Attorney General's office
- Massachusetts Office of Technical Assistance
- U.S. Environmental Protection Agency
- environmental organizations
- industry groups
- citizen input during the prior year (through complaints and tips)

Initiatives may span multiple years. Initiatives may be discontinued on the basis of "saturation" of the category. That is, if a majority of facilities are found to be in compliance and/or the majority of such facilities have been reached, the initiative may be discontinued.

2.3.3 Flexible Targeting and Multimedia Inspections

When flexible targeting is coupled with the multimedia inspection approach, new capabilities emerge. Multiple single medium inspections at small facilities would not be a sensible use of resources, but multimedia inspections are well-suited for such sites. The Blackstone Project reported that traditional inspections were considered too costly in staff time for small hazardous waste sources (8 hours) and air sources (7.5 hours). It found under the multimedia approach, they could be completed in 4 and 2.5 hours respectively.[5] More recent data supports this. For example, fuel dispensers are inspected for hazardous waste and industrial wastewater as well as air quality in one inspection, taking an average of just two hours.[6] Similarly, an analysis of one-half year's inspections in FY95 found that, on average, a facility inspection and all ancillary

[5] "FY90 Report on the Blackstone Project", Massachusetts DEP, July 23, 1990.
[6] Reported in interviews with inspectors.

inspector duties requires about 34 hours, or 6.8 hours per regulatory program.[7] Additional data gathering and reporting requirements for multimedia inspections, in addition to seeking pollution prevention opportunities during the inspection, may account in part for the larger time requirement. (A counter-intuitive observation came from an inspector who said that smaller facilities often take longer than large sites because additional effort is spent educating facility staff [offering compliance assistance and pollution prevention information is part of an inspector's responsibilities].)

Flexible targeting also allows a greater variety of facilities to be inspected each year by targeting each facility for a single multimedia inspection. Since inspecting a small facility requires less time than a large multi-program site, omitting some of the old large facilities with a history of compliance in some years allows for substitution of several small facilities. One benefit: DEP inspectors establish a wider geographical presence, presumably providing a greater deterrent effect, while a regulatory presence is still maintained at "major sources."

2.4 1995: Inspection and Enforcement Rate Analysis

The following is an analysis of the Consolidated Compliance Assurance Demonstration Grant results of fiscal year 1995 by inspection category.[8] Table 2-1 lists each 1995 inspection category, its description, and site selection criteria.

2.4.1 Enforcement Rate by Inspection Category

The enforcement rate among all inspection categories was **55%**[9] and the rate of higher level enforcement actions[10] was **3%.** Inspection categories are classified either as "grant" or "state". Grant categories are constrained: facilities must have specific characteristics to fall into a grant category. By contrast, state categories are broader: they allow DEP the freedom to inspect complaints, tips, suspicious activity, etc., as they arise. State categories allow more direct and more responsive targeting. The enforcement rate within grant categories was 48% and for state categories was 68% (Exhibit 2-5). The rate of higher level enforcement actions was 2% for grant categories and 6% for state categories. The difference suggests that confining inspections to specific facilities limits DEP's ability to find violators.

Interpretation of the enforcement rate is a complicated question. Is a low rate good? In that there are few violations and/or few facilities actually in violation, then a low rate is

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[7] From a department memo entitled "BWP Regional Time Analysis for FY95", dated 3/8/96.

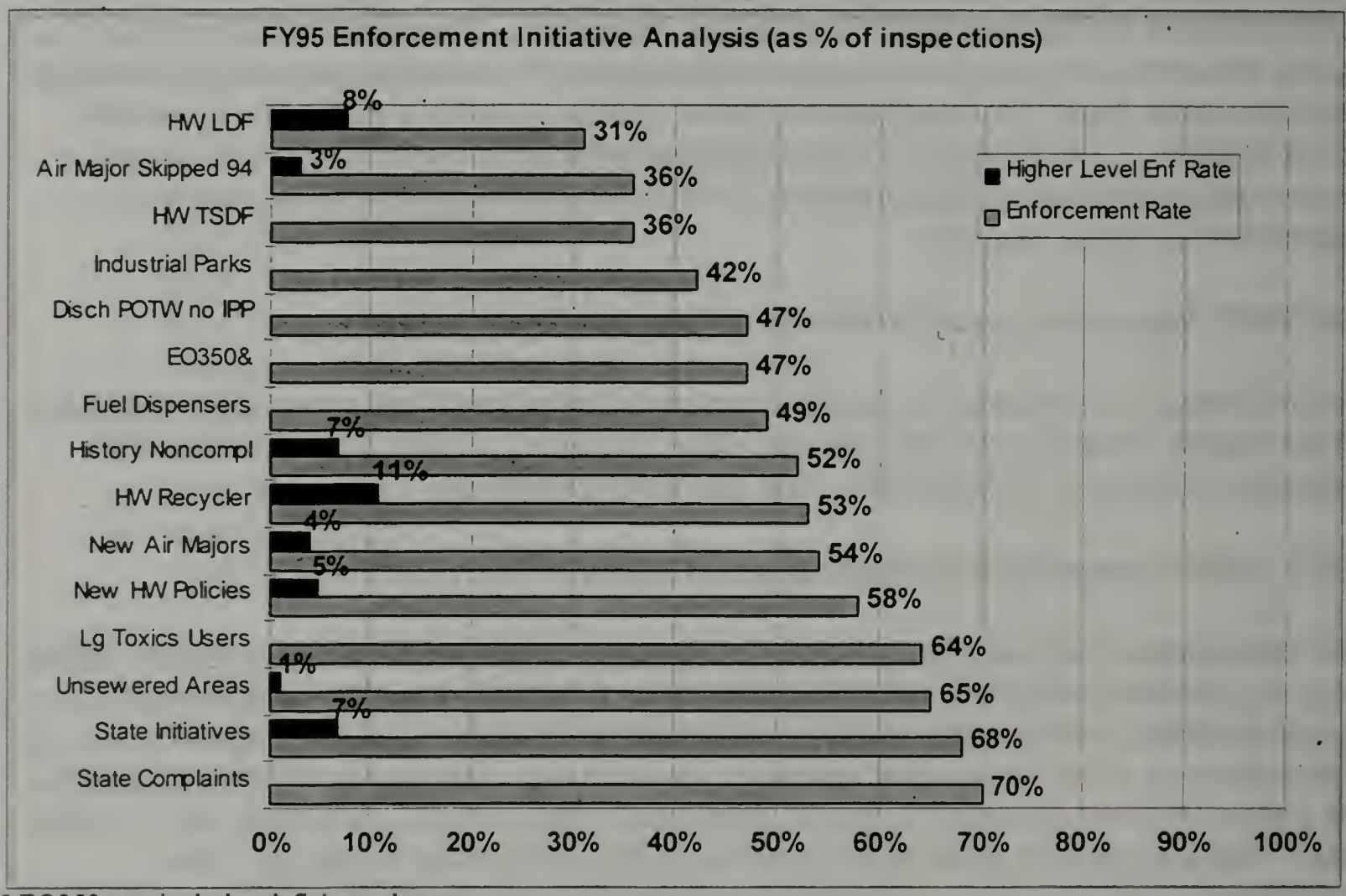
[8] The results are tabulated in a spreadsheet titled "Massachusetts Department of Environmental Protection Consolidated Compliance Assurance Demonstration Grant Results of Fiscal Year 1995 Inspection Categories".

[9] 599 facilities received enforcements or informal warnings out of 1086 facilities inspected.

[10] A "higher level enforcement action" is defined as any enforcement action stricter than a "Notice of Noncompliance" (NON). Higher level enforcements include Administrative Consent Orders with or without a penalty (ACOs and ACOPs), Penalty Assessment Notices (PANs), and Unilateral Administrative Orders (UAOs), in addition to referrals to the U.S. EPA or to the Massachusetts Attorney General for civil or criminal prosecution.

good because it accurately reflects the state of the regulated community. In that it indicates few actual violations detected, then a low rate is bad as it allows offenders to pollute. While a high enforcement rate shows that the bureau is finding violations, it simultaneously reflects a poor state of environmental compliance, at least in certain pockets[11]. Taken within the context of the range of interpretations, a high violation rate within an inspection category suggests at a minimum that the initiative was a good target.

Exhibit 2-5



&EO350 rate includes deficiency letters.

The highest FY95 enforcement rates were found among:

- complaints **(70%)**
- state initiatives **(68%)**
- facilities in unsewered areas **(65%)**
- Large Quantity Toxics Users (LQTUs) **(64%)**.
- facilities impacted by new or changed regulations **(58%)**
- new Clean Air Act major sources[12] **(54%)**

[11] Note that a majority of BWP's enforcement actions are Notices of Noncompliance (NON) indicating generally less-significant and first-time violations.

[12] Clean Air Act category includes both newly created sources and newly classified sources under revisions to the Clean Air Act.

It is not surprising that a higher occurrence of offenders would be found among complaints. The state initiatives category is, as noted, broader and more responsive than other categories. Unlike sewered areas, facilities in unsewered areas receive little regulatory attention at the local level so operating outside the law is easier. Therefore, the high enforcement rate was not unexpected. There appears to be no apparent explanation for the high violation rate at inspected LQTUs. Perhaps because by their nature as producers and/or users of large amounts of toxic chemicals, there is greater potential for problems. Additionally, LQTUs are subject to relatively new and complex Toxics Use Reduction Act (TURA) regulations. Violations covered by new or strengthened regulations likely occur at a higher rate than regulations which have existed longer, as facilities learn about them and come into compliance. Newer companies[13] are more likely to be in violation than older, presumably more experienced, companies. Three inspectors reported in interviews that violations are being found more often at newer facilities.

The lowest enforcement rates were found among[14]:

- hazardous waste land disposal facilities (LDFs) **(31%)**
- EPA's air priority sources skipped in 1994 **(36%)**
- hazardous waste treatment or storage facilities (TSDFs) **(36%)**

The reason for the low enforcement rate among hazardous waste LDFs is likely that the on-site impoundments are now separate at all sites from the facilities' industrial activities (these facilities have changed hands since the era when the impoundment was active, and now perform different industrial activities), and the impoundments are under closure and monitoring requirements. Thus, the few violations found within the manufacturing facility largely composes the enforcement rate found at the site overall. Additionally, hazardous waste LDFs and TSDFs are highly regulated and regularly inspected for specific requirements, partly explaining the lower than average rates.

It is similarly believed that the lower than average enforcement rate among air priority sources is because these larger facilities have been regulated and inspected for many years and are mainly aware of compliance requirements. Interviews with inspectors support this possibility. They report that these facilities know the regulations and in many cases employ a full-time environmental manager (one inspector estimated that 80% of the older, larger air sources he inspects have one).

(Note that under the consolidated grant, the "EPA priority sources" category averaged 31% to 34% enforcement, comparable to the least productive categories in the demonstration grant in FY95.)

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[13] "New" facilities were defined by inspectors in interviews as operating five years or less.

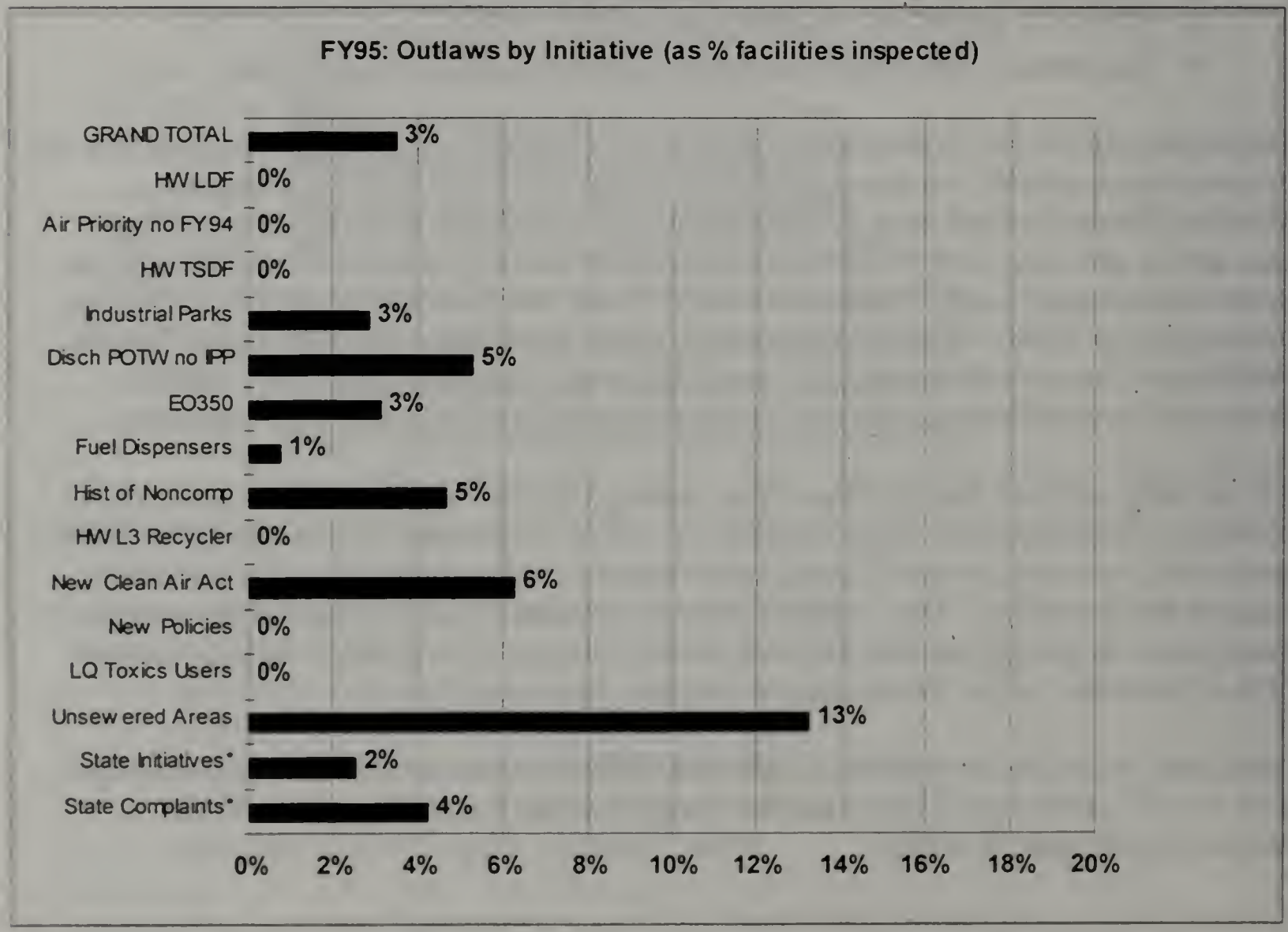
[14] The EO350 "enforcement rate" includes informal warnings. State agencies found in violation are subject to an "EO350 Letter". They are included here to illustrate the rate of violations found at facilities in this category. The actual enforcement rate is much lower, 32%, and otherwise would be included in this discussion.

In addition to traditional measures of inspection and enforcement productivity, BWP has developed two additional measures which more directly reflect environmental outcomes. These are the number (or percentage) of "outlaw" facilities (those which are unpermitted, unregistered, or unlicensed in at least one waste media program area), and the number (or percentage) of "multimedia hits", those facilities for which enforcement actions include violations in more than one waste media program area). The multimedia hits analysis is presented in the following section.

Unpermitted and unregistered waste streams were found most often at (Exhibit 2-6):

- facilities in unsewered areas **(58%)**
- new Clean Air Act major sources **(38%)**
- complaints **(36%)**
- facilities with a discharge to a publicly owned sewage treatment works (POTW) that does not have an EPA-approved industrial wastewater pretreatment program **(32%)**

Exhibit 2-6



Unsewered areas have a high number of illegal waste streams for the same reason they have a high overall enforcement rate: there is little oversight by local authorities in unsewered areas. Furthermore, illegal disposal in unsewered areas poses a greater

public health threat than in sewered areas. Given these factors, DEP selects these high risk targets for inspection and indeed finds a higher number of unregistered waste streams in these areas. Similarly, in areas with a POTW without an EPA-approved industrial wastewater pretreatment program, the potential risk to public health and the environment of an illegal waste discharge determines DEP's priority. Again, the higher rates among complaints and new Clean Air Act major sources can be explained as above. Note that "outlaws" may be as relatively insignificant as an unregistered Very Small Quantity Generator of waste oil (regulated only by the state, not federally), or may be as great as an unpermitted process line emitting air pollution. In fact, most "outlaw" activity is relatively minor, reflected in the large proportion of Notices of Noncompliance rather than higher level enforcement.

The overall rate of higher level enforcements among all categories, both grant and state, was **3.1%**: 2% within grant categories and 6% for state categories. Higher level enforcements generally indicate more significant violations or a pattern of violations at a facility.

The highest rates were found among:

- hazardous waste level 3 recyclers **(11%)**
- hazardous waste LDFs **(8%)**
- state initiatives **(7%)**

The highest numbers were found at:

- state initiative inspections **(20)**
- facilities inspected because of a history of noncompliance **(6)**

Where the higher level enforcement indicates a more significant environmental problem, these figures suggest that DEP BWP selects state initiative inspection sites such that serious environmental threats are successfully detected. The relatively high number of higher level enforcements among facilities with a history of noncompliance indicates that repeated violations are ultimately elevated in enforcement status. Violations at hazardous waste level 3 recyclers and hazardous waste LDFs are by nature potentially more serious and these facilities are subject to frequent DEP scrutiny; this could explain the rate of higher level enforcement. The number of facilities inspected in each of these two categories is low (fewer than 20 each) and hence, the number of higher level enforcements is also low. It is more difficult to draw conclusions using this measure because the absolute numbers of higher level enforcements are low in all categories (fewer than 20).

2.4.2 Enforcement Rate by Regulatory Program

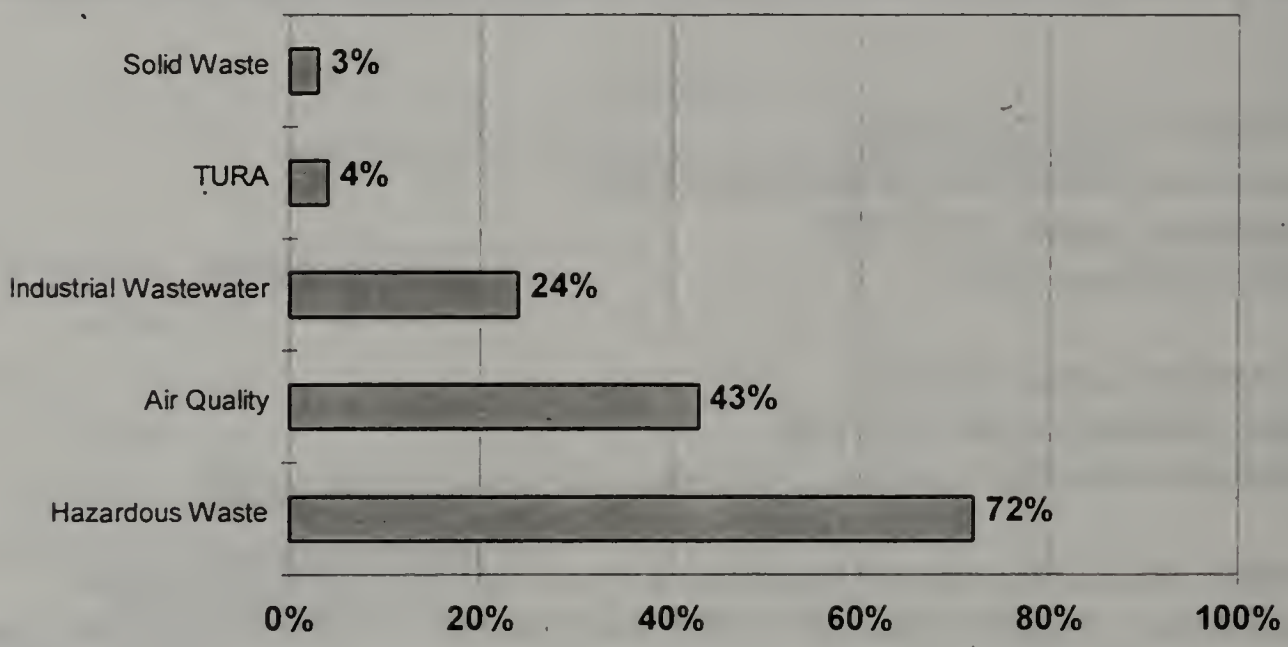
Among facilities in violation of regulations overseen by BWP, hazardous waste was the most often violated regulatory program (**72%** of all facilities in violation), followed by air

quality **(43%)** and industrial wastewater **(24%)**, with TURA **(4%)** and solid waste **(3%)** occurring more seldom (Exhibit 2-7).[15]

The low rate of enforcement of solid waste disposal regulations may be explained via inspectors' experiences: inspectors indicated in interviews that the solid waste portion of the inspection protocol was not useful because, in their opinion, industry has been recycling to the level of detail in the protocol for years because the economic incentive to do so exists. Therefore, few solid waste disposal violations occur. (The inspection protocol is not evaluating compliance with municipalities' recycling requirements, only compliance with state-regulated solid waste disposal activities.)

Exhibit 2-7

FY95: Percentage of Facilities Under Enforcement, by Waste Medium (total exceeds 100% due to multimedia enforcement)



Several inspectors indicated their low comfort level with the TURA part of the inspections, particularly in conducting TURA plan reviews. They note that the inspection protocol seems lacking adequate TURA guidance. These findings could explain the low rate of TURA enforcements. In addition, a few inspectors reported that most facilities they inspect are not subject to TURA requirements, that is, the facilities are not Large Quantity Toxics Users (LQTUs).

Primarily for EPA's tracking needs, BWP analyzed its inspections according to traditional waste media regulatory programs. The number of inspections in various regulatory status classifications is presented below:

Hazardous Waste Large Quantity Generator (LQG)	101	(of 540)
Hazardous Waste Small Quantity Generator (SQG)	161	

[15] Total percentages exceed 100% because many facilities are in violation of more than one program.

Air Quality A1-Major	135	(of 680)
NPDES Major	12	(of 60)

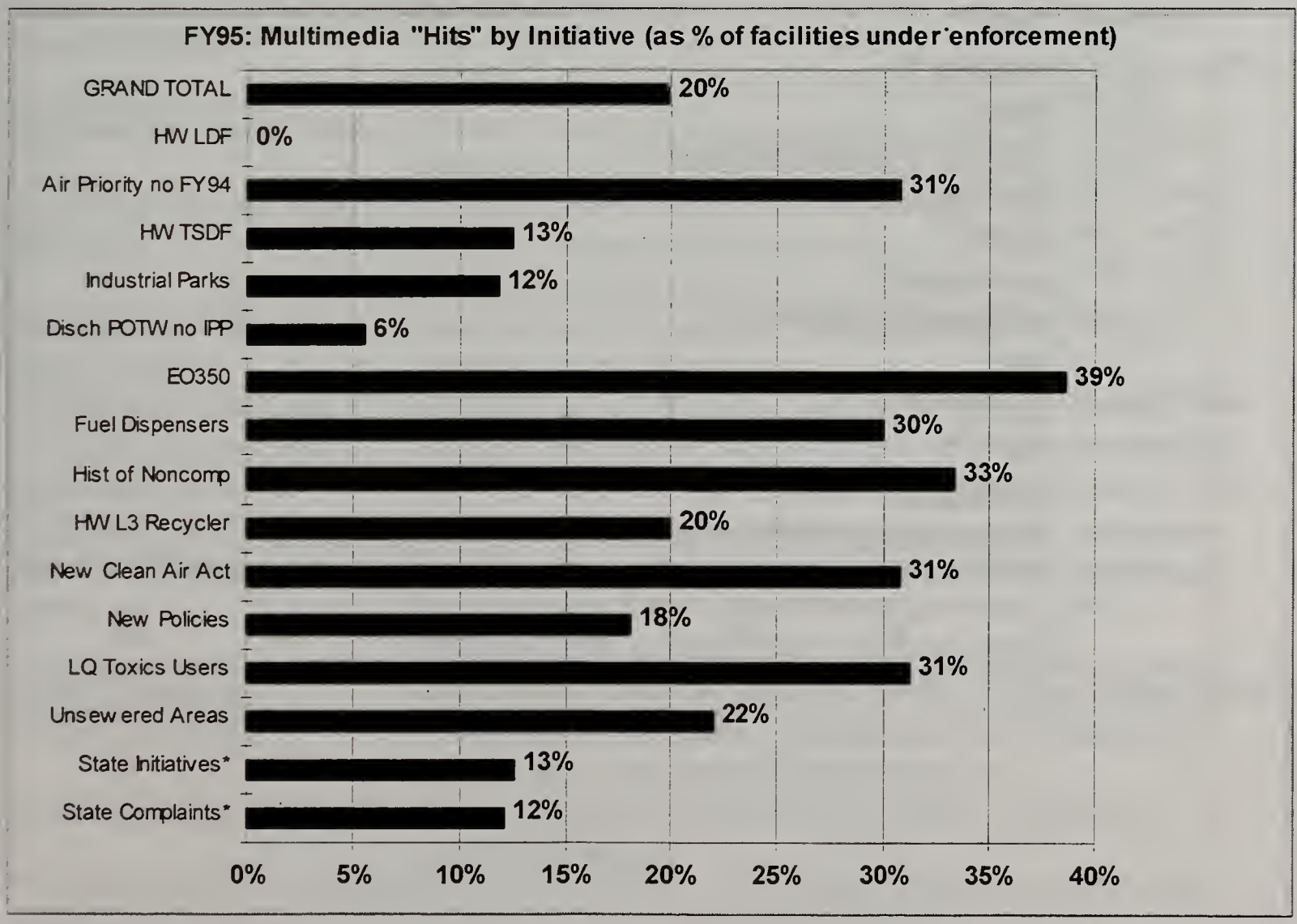
Among all facilities where violations were detected, the average number of regulatory programs violationed per facility was **1.43** out of 5 (hazardous waste, solid waste, industrial wastewater, toxics use reduction, and air quality). This number was highest among new Clean Air Act major sources **(2.15)**.

The greatest percentage of multimedia enforcement took place in:

- executive order 350 "Clean State" **(39%)**
- history of noncompliance **(33%)**
- new clean air act majors **(31%)**
- large quantity toxics users **(31%)**

The average "multimedia hit" rate is 20%, meaning that of all enforcement actions issued, one in five cited violations in more than one waste media regulatory program area (Exhibit 2-8).

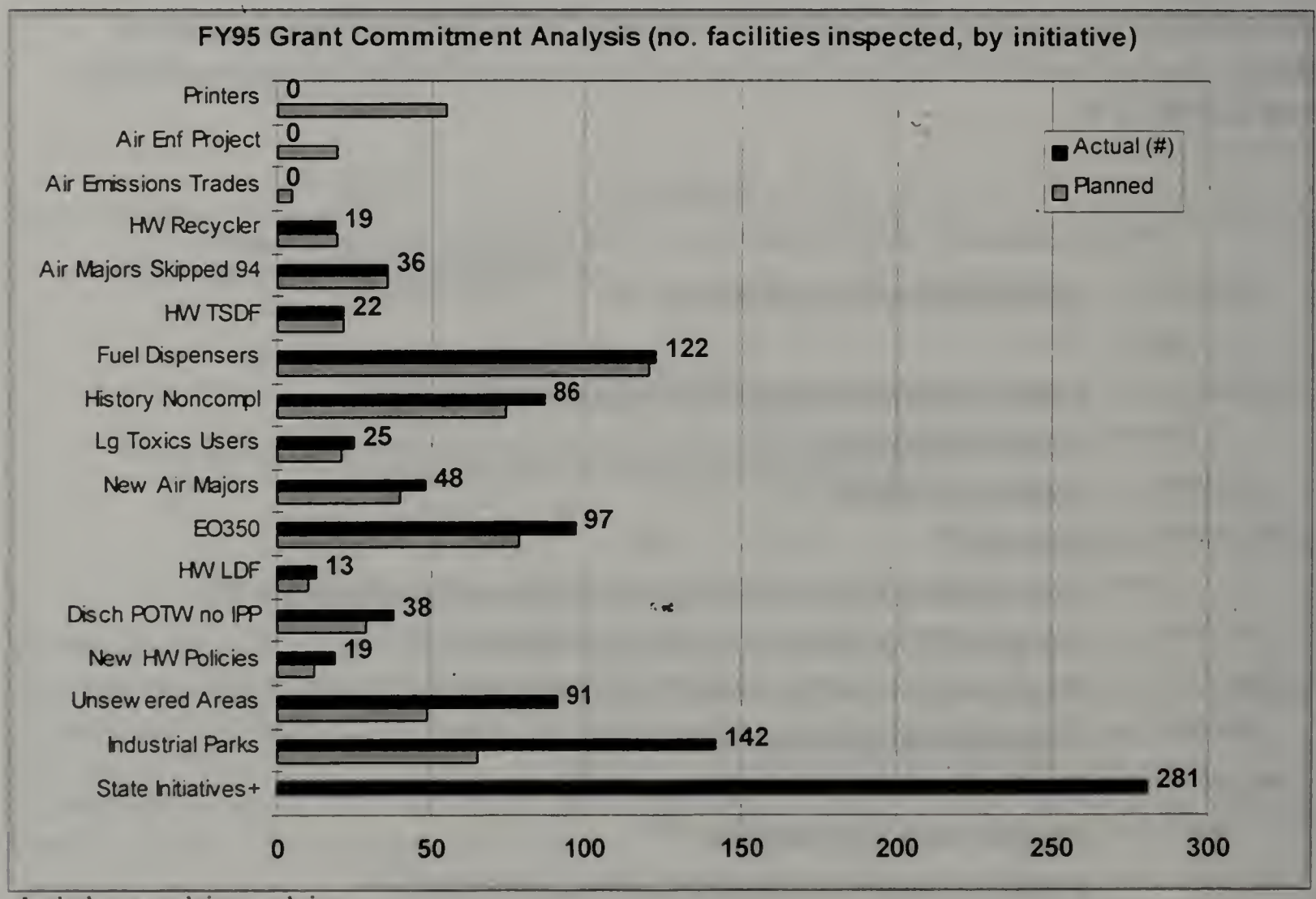
Exhibit 2-8



2.4.3 Inspections: Actual vs. Grant Proposal

The numbers of inspections promised in the grant proposal for 1995[16] were met or exceeded in nearly every category. The printers initiative was postponed until FY 1996. Two categories, air emissions trades and air enforcement project were not conducted during the two-year grant period. (Only 2 facilities in the state were granted air emissions trades approval during FY96, so compliance with the requirements could not yet be established. The air enforcement project involved the joint activity of EPA, the Massachusetts Attorney General, and DEP; no priority enforcement cases occurred during the grant period requiring this joint activity.) Overall, 158% of the total number of planned inspections were met (Exhibit 2-9).

Exhibit 2-9



+Includes complaints and tips.

[16] Compared with the numbers in "FY95 Demo Grant Inspection Allocations, Revised 2/9/95".

Table 2-1: 1995 Inspection Categories

Grant Category	Description and Selection Criteria
Air Priority Sources Skipped in FY94	AQ national priority sources; EPA list of sources skipped for inspection in FY94
Clean State (EO350)	State-run facilities; regions select facilities reporting noncompliance first, then based on risk level
Fuel Dispensers	Inspect for Stage I and II compliance; randomly selected, statistically meaningful number
History of Noncompliance	Priority order: 1) designated Federal noncompliers; 2) major sources w/ past higher level enforcement; 3) minor sources w/ higher level enforcement; 4) sources w/ history of minor violations
Hazardous Waste LDFs	About half the hazardous waste land disposal facilities in MA (remainder in FY96); EPA list
Hazardous Waste Level 3 Recyclers	Commercial level 3 hazardous waste recycler (primarily off-site); regions target
Hazardous Waste TSDFs	All hazardous waste treatment or storage facilities in MA; EPA list
Industrial Parks	Find facilities in industrial parks operating outside BWP regs; regions develop own targeting methods
Lg Quantity Toxics Users	Focus on poor TURA reporters and facilities failing to submit &/or certify plan summaries; regions select
New Clean Air Act Major Sources	Sources newly subject to CAAA "major" status: focus on unpermitted facilities w/ VOC and NOx emissions between 50-99 tpy; regions select
Facilities Impacted by New Policies	Several new HW policies; mainly selected by regions w/ support from Boston
Facilities w/ Discharge to a POTW w/o an EPA-Approved Industrial Pretreatment Program	Facilities w/ wet process discharge; regions identify POTWs without IPP which have facilities with compliance problems
Facilities in Unsewered Areas	Facilities w/ wet process discharge; priority where local drinking water supply exists (private, public, surface-water, groundwater); regions identify
State Category	**Description and Selection Criteria**
State Complaints	Complaints from public are received and reviewed by regions for possible inspection follow-up
State Initiatives	Tips, suspicious activity, more; regions, inspectors, and others select

*In all categories where region has responsibility for facility selection, priority is within the region's geotarget area(s).

2.5 1996: Inspection and Enforcement Rate Analysis

The following is an analysis of the Compliance Assurance Demonstration Grant results of fiscal year 1996 by inspection category. Table 2-2 lists each 1996 inspection category, its description, and site selection criteria.

For the first time, BWP was able to access its data in an internally consistent manner for FY96 inspection activities. That is, in previous years, BWP was forced to analyze the number of inspection activities which occurred in a time period, and the number of enforcement activities which occurred in the same time period, whether or not they took place at the same facility. Thus, some enforcement actions were counted which occurred early in the year and were reflections of inspections performed in the previous year, and some inspection activities were counted which occurred late in the year and would result in enforcement actions issued the following year. BWP was forced to use this delinked method of analyzing performance due to data system limitations, and relied on the "law of averages" to conclude that as many actions would be missed at a year's beginning and end. In fiscal year 1996, BWP was able to follow the "chain of events" occuring at a facility. Thus, these analyses show inspection activities which occurred in FY96 and all ensuing enforcement issued through first quarter of fiscal year 1997. This provides a more accurate picture of the environmental results of each enforcement initiative than in previous years.

2.5.1 Enforcement Rate by Inspection Category

The enforcement rate among all categories, both grant and state, was **58%**[17]: 54% within grant categories and 68% for state categories (Exhibit 2-10). The total is up slightly from 1995 (55%). The rate of higher level enforcement was **2.7%**: 2.3% for grant categories and 3.7% for state categories, a slight overall decline from 1995 (3.1%).

The highest violation rates were found among:

- SIP review **(100%)**
- high risk of noncompliance **(76%)**
- fuel dispensers **(70%)**

The 100 percent rate of noncompliance in the category "SIP review" is not meaningful as only one facility was inspected in this category. Complaints received a separate category 1995; in 1996, they were in the categories of high risk of noncompliance and/or state initiatives mainly, with a few scattered among other categories. This category has a higher than average violation rate (76%) which is consistent with the 1995 figure for complaints (70%), probably for the same reasons. Fuel dispensers have come under new strict vapor recovery (Stage I and II) regulations in the last five years. Additionally, most had never been inspected. Consequently, DEP believed there was a

[17] 622 facilities received enforcements or informal warnings; 1,067 facilities were inspected.

high probability that many facilities were out of compliance with the new regulations due in part to the unfamiliarity of these facilities with state inspectors. The very high violation rate in this category shows that DEP's decision to target this sector was productive. Compared to 1995 (49%), the 70% rate is much higher. This difference reflects, in part, results of the improved training provided to BWP staff following first round of inspections.

The lowest violation rates were found at[18]:

- printers **(37%)**
- industrial parks **(46%)**
- hazardous waste TSDFs **(50%)**

The low rate of enforcement (including deficiency letters) among printers may reflect, in part, the effect of a substantial compliance assistance project implemented during FY96 (discussed later in this report). The industrial park figure for 1996 (46%) is up slightly from 1995 (42%). The relatively low rate of enforcement for hazardous waste treatment or storage facilities (disposal facilities are captured under HW LDFs) may be due to the explanation as with other "major" or national priority facilities: environmental managers and environmental systems are relatively reliable in maintaining facility compliance (although the enforcement rate is up slightly from 1995 [36%]).

Categories which showed the largest changes include unsewered areas, EO350, and hazardous waste recyclers. Unsewered area inspections decreased to 55% from 65%. This was a new initiative in 1995 and the majority of facilities in violation may have been discovered and acted upon that year, leaving fewer violating facilities to be identified in 1996. EO350 increased from 47% to 62% reflecting increased emphasis and a shift to include some highway department facilities. Hazardous waste recyclers increased from 53% to 67% reflecting a shift from commercial non-precious-metals facilities to those recycling precious metals.

Categories for which the enforcement rate remained about the same include TURA Large Quantity Toxics Users (64% to 61%) and facilities with a history of noncompliance (52% to 57%).

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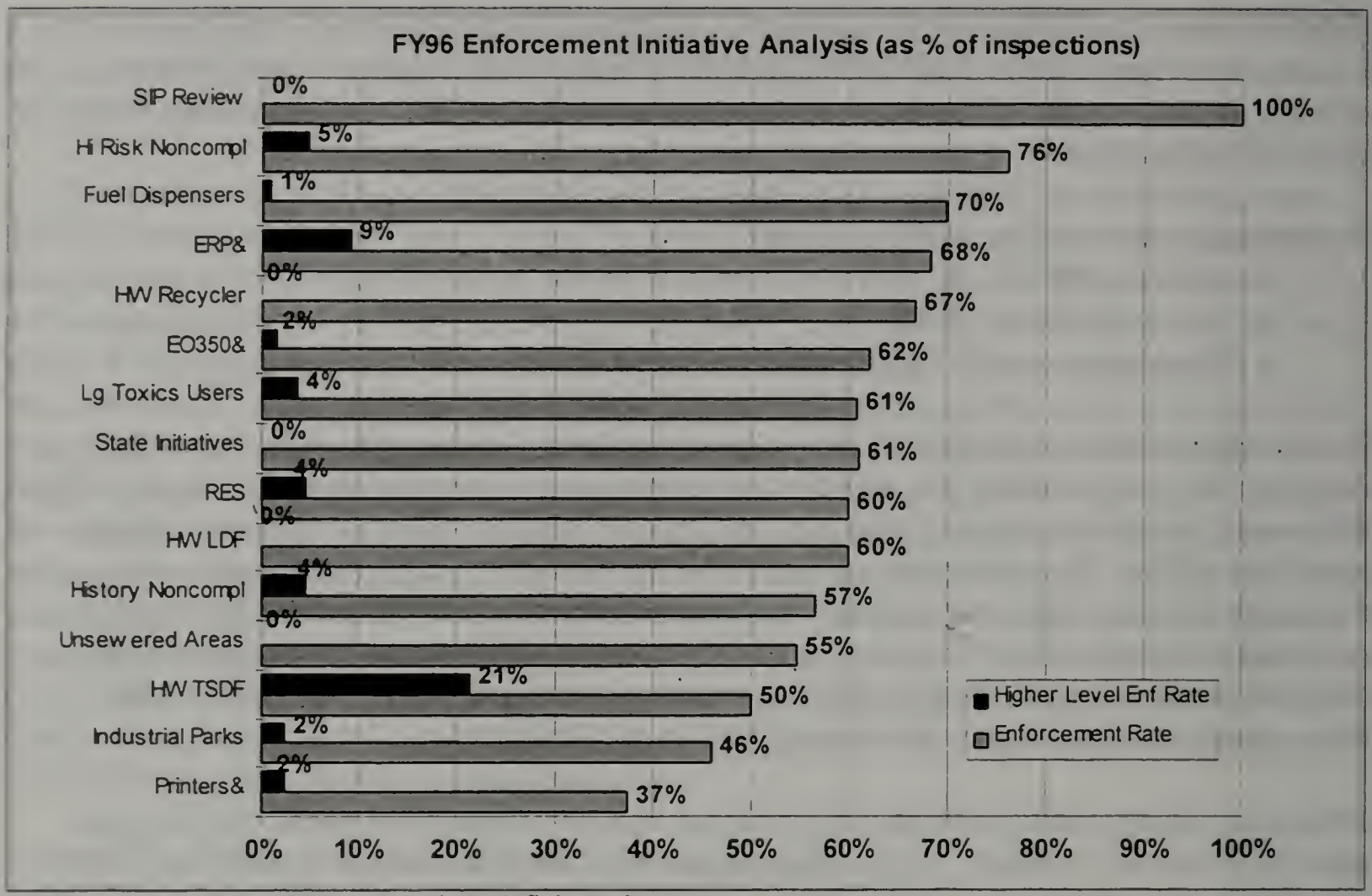
[18] EO350, printers, and ERP enforcement rates include deficiency letters. State agencies found in violation are subject to an "EO350 Letter". Printers found in violation receive a "Non-NON" which is like a NON except that it is an informal warning letter. ERP demonstration facilities are temporarily exempt from minor enforcement in exchange for participating in the ERP program. Although ERP demonstration facilities found in violation are required to correct violations, formal enforcement is not brought forth initially unless significant environmental threats are discovered. These informal measures are included here to illustrate the rate of violations found at facilities in these categories.

Exhibit 2-10



&EO350, Printers, and ERP rates include deficiency letters.

The overall rate of higher level enforcements[19] among all categories, both grant and state, was **2.7%**, down slightly from 3.1% in 1995: 2% within grant categories (same as 1995) and 4% for state categories (down from 6%). The highest rates were found among:

- hazardous waste TSDFs **(21%)**
- Environmental Results Program demonstration facilities **(9%)**
- facilities with a high risk of noncompliance **(5%)**

The highest numbers were found at:

- high risk of noncompliance **(8)**
- history of noncompliance **(4)**
- industrial parks **(4)**

Facilities selected for the "high risk" category were chosen, in part, because of an increased risk of violations with potentially significant impacts which would receive a higher level enforcement action as a first step. The high rate among facilities with a history of noncompliance is explained by the elevation in status of uncorrected or new,

[19] Regional differences were found in the number of higher level enforcements recorded. The northeast and southeast regions register but 1 or 2 each for 1996, whereas the central and western regions register the remainder.

additional violations. Facilities in industrial parks tend to be newer and never before inspected. Therefore, finding several such facilities with particularly egregious violations may be expected.

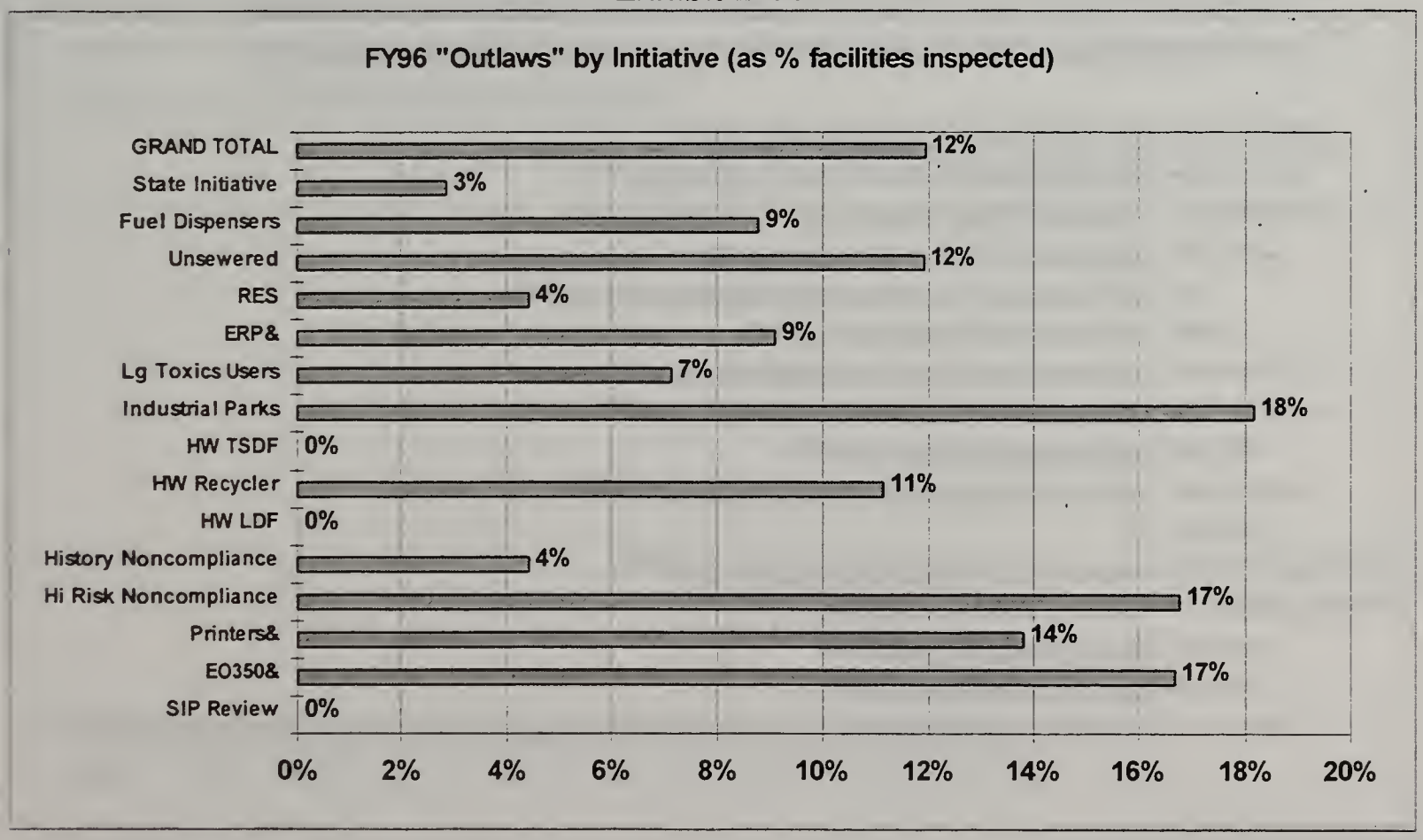
Unregistered or unpermited sources were found most often at (Exhibit 2-11):

- industrial parks **(18%)**
- high risk of noncompliance **(17%)**
- executive order 350 "Clean State" **(17%)**

The overall rate of "outlaws" was 12% of all inspections, four times the rate of FY95. Recall that in fiscal year 1996, BWP was able to follow the "chain of events" occuring at a facility. Thus, these analyses show inspection activities which occurred in FY96 and all ensuing enforcement issued through first quarter of fiscal year 1997. This provides a more accurate picture of the environmental results of each enforcement initiative than in previous years.

The categories of industrial parks and high risk of noncompliance were initially intended to discover exactly this sort of "outside the system" activity on the part of noncompliant facilties. The success rates in these areas are very encouraging to BWP. Note that, overall, more than one in ten inspections under the flexible targeting approach discovers "outlaw" activity (although much of this activity is of lesser environmental significance, as previously noted, and does not pose an enormous risk to Massachusetts residents or the environment).

Exhibit 2-11



Unfortunately, as of press time, data were unavailable to demonstrate the distribution of facilities in violation of each of the five major waste medium regulatory programs (solid waste disposal, toxics use reduction act, industrial wastewater, air quality, and hazardous waste) for fiscal year 1996. Using professional judgement and a sense of what was observed during inspections, BWP's staff feel that the distribution shown for FY95 probably reflects FY96 results as well.

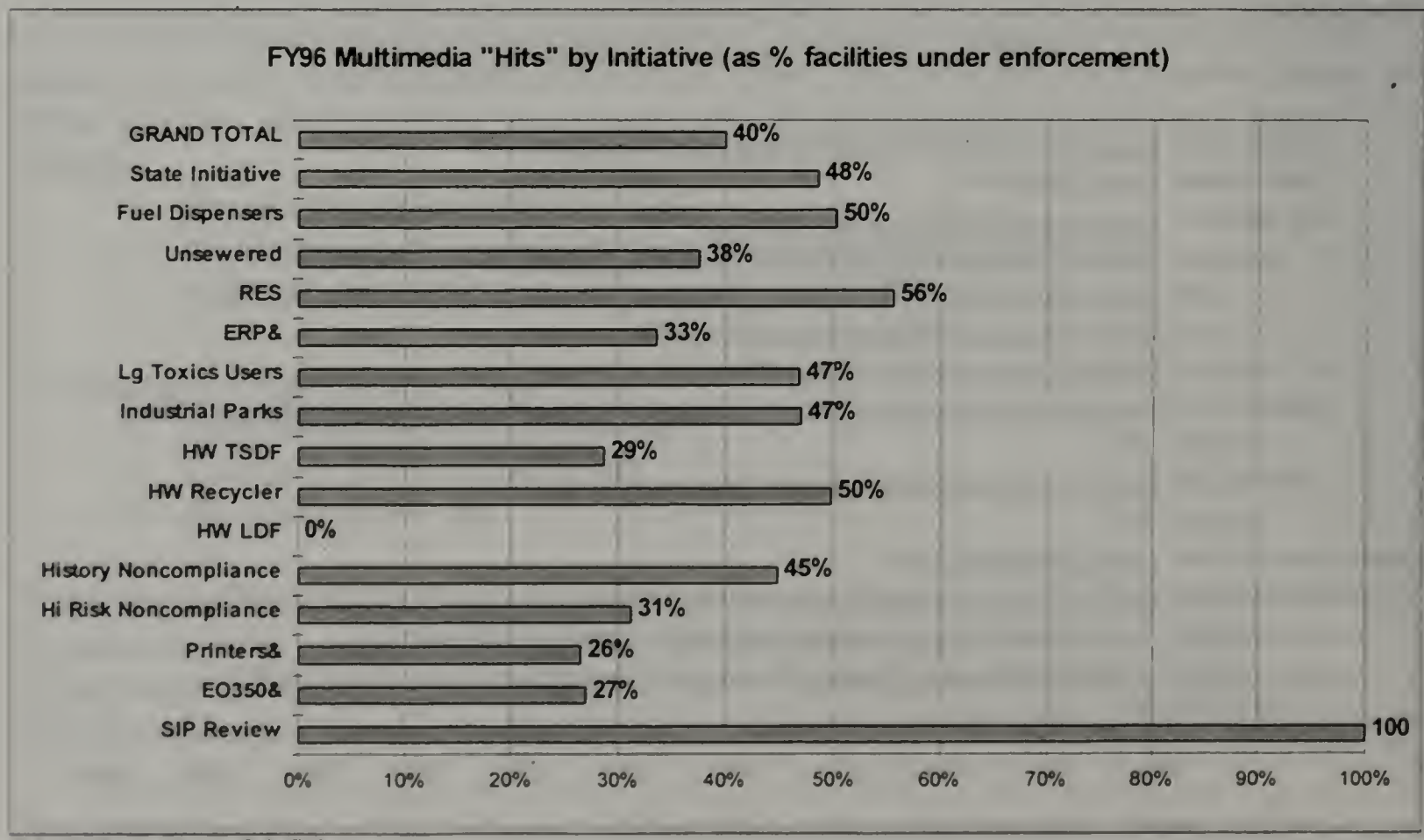
The greatest percentage of multimedia enforcement took place in:

- single source SIP revisions **(100%)**
- restricted emission status (RES) **(56%)**
- hazardous waste recyclers **(50%)**
- fuel dispensers **(50%)**

The finding of 100% multimedia enforcement at single source SIP revision facilities is not meaningful in that only one source was inspected in this category. It is notable that, with the exception of hazardous waste land disposal facilities, no category shows less than about one-third of its enforcement actions as citing violations in more than one waste medium regulatory program.

The average "multimedia hit" rate is 40%, meaning that of all enforcement actions issued, two in five cited violations in more than one waste media regulatory program, double the rate found in fiscal year 1995 (Exhibit 2-12).

Exhibit 2-12



&Includes letters of deficiency.

2.5.2 Inspections: Actual vs. Grant Proposal

The actual number of facilities inspected equaled or exceeded the planned number in all but three categories. The decreases in these categories were not significant. Overall, BWP performed 159% of planned inspections (Exhibit 2-13).

Exhibit 2-13

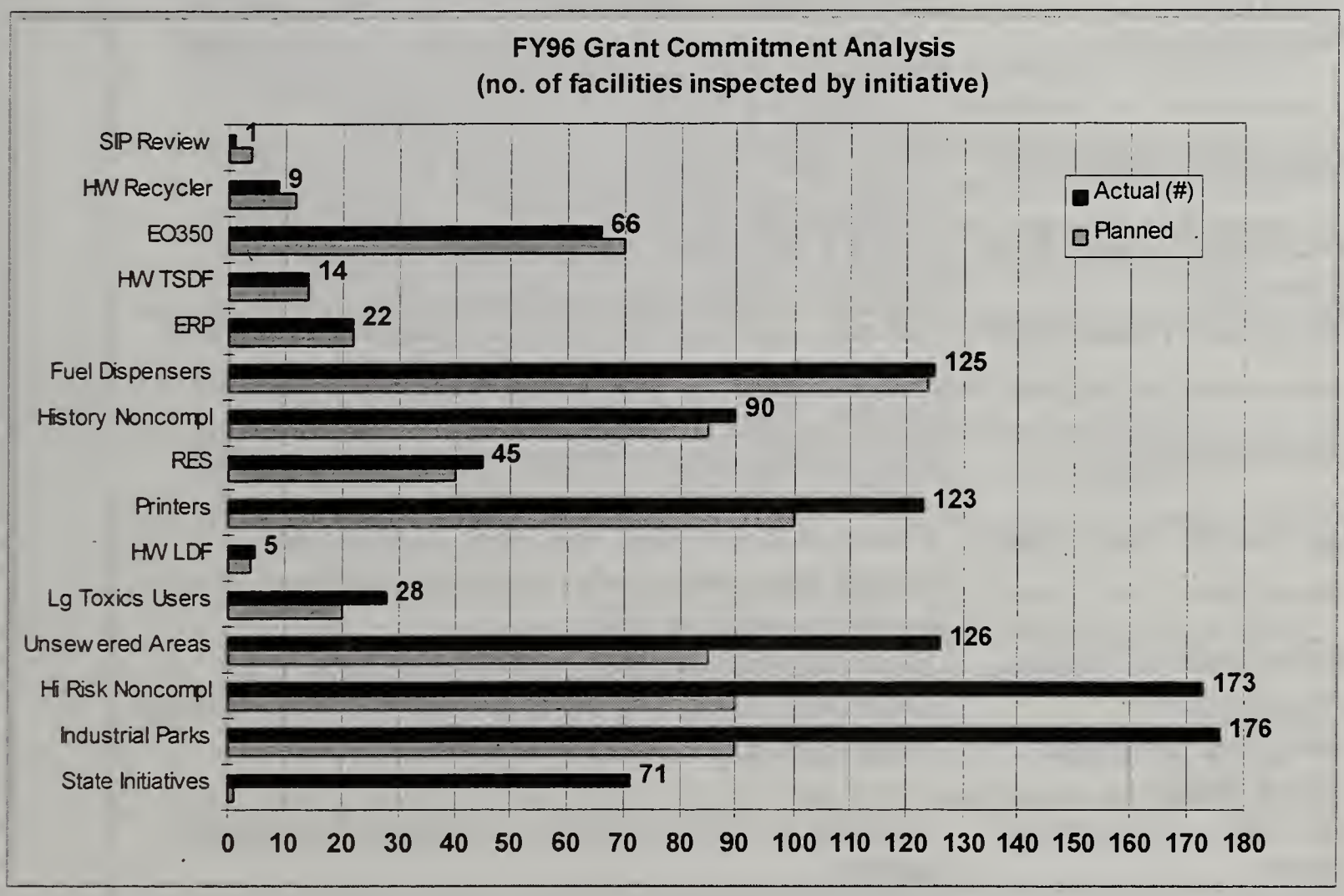


Table 2-2: 1996 Inspection Categories

Grant Category	**Description and Selection Criteria**
SIP Review	Single-source SIP revisions; regions select from master list supplied by Boston
Clean State (EO350)	State facilities; regions select facilities reporting noncompliance first, nonreporters, then based on risk
History of Noncompliance	Priority order: 1) sources of HPVs, SNCs, & SVs; 2) major sources w/ past higher level enforcement; 3) minor sources w/ higher level enforcement; 4) sources w/ history of minor violations
Hazardous Waste LDFs	About half the hazardous waste land disposal facilities (remainder from FY95); regions select
Hazardous Waste Level 3 Recyclers	Level 3 hazardous waste recyclers, primarily of precious metals and not inspected in FY95
Hazardous Waste TSDFs	Off-site, commercial hazardous waste treatment or storage facilities mainly dealing w/ RCRA hazardous wastes; also waste oil; all are inspected
Industrial Parks	Find facilities in industrial parks operating outside BWP knowledge; regions select
Lg Quantity Toxics Users	Focus on poor TURA reporters, facilities failing to submit &/or certify plan summaries, facilities w/ past problems; regions select
Environmental Results Program (ERP)	Demonstration facilities participating in this self-certification program; list of sites provided by Boston
Restricted Emissions Status (RES)	Regions select RES sites in geotarget area
Facilities in Unsewered Areas	Facilities w/ wet processes w/ a discharge; regions identify
Printers	Inspect for compliance; randomly selected, statistically meaningful number; list provided by Boston
High Risk of Noncompliance	Complaints from public, facilities not inspected in last 3-5 yrs), self-reporting facilities with potential problems, tips, etc.; also, closed shop air majors; regions select
State Category	**Description and Selection Criteria**
Fuel Dispensers	Inspect for Stage I and II compliance; randomly selected, statistically meaningful number; list provided by Boston
State Initiatives	Tips, suspicious activity, lots more; regions, inspectors, and others select

*In all categories where region has responsibility for facility selection, priority is within the region's geotarget area(s).

2.6 Conclusions

A few themes emerge from the experience provided by the demonstration grant:

- Regardless of whether the number of facilities inspected is increasing under the multimedia approach, a greater variety of facilities are inspected and each inspection is more comprehensive, finding a wider array of violations in more than one regulatory program area.

- New measures of environmental program outcomes which DEP has found useful include the rate of "outlaws" (unpermitted, unregistered, or unlicensed activities at a facility) and the "multimedia hit" rate (violations discovered in more than one waste medium program). These measures better reflect the efficiency and effectiveness of the coupled multimedia inspection / flexible targeting approach than relying solely on the traditional inspection and enforcement productivity measures.

- DEP has also found it useful to quantify both traditional productivity measures and outlaw and multimedia hit rate analyses according to the flexible enforcement initiative targeting categories in addition to the regulatory program status ("major" and "minor").

- The highest enforcement rates and highest rates of "outlaws" and "multimedia hits" are generally among categories with the greatest flexibility which allow broader and more responsive targeting than other categories.

- Several specifically-targeted sector initiatives where DEP suspected a high noncompliance rate have proven so such as fuel dispensers and facilities in unsewered areas.

- Grant-specified inspection numbers were exceeded by about 54% for FY95 and for FY96.

3. Waste Prevention FIRST CEI: Protocol

The Facility-wide Inspections to Reduce the Source of Toxics (FIRST) Compliance Evaluation Inspection (CEI) Protocol (also called "Protocol B" or "The Protocol") is a multimedia inspection protocol using a process-based approach to determining regulatory compliance in addition to fostering opportunities for identifying pollution prevention or source reduction projects. The protocol is used as a guide for the minimum elements of all compliance inspections of industrial, manufacturing, and commercial facilities (with few exceptions) performed by DEP Bureau of Waste Prevention (BWP) regional field inspectors.

3.1 History and Development of FIRST CEI Protocol

The guiding principles in developing the protocol were explicit:

1) develop a multimedia, process-based, regulatory compliance evaluation inspection

2) include a pollution prevention/source reduction bias

The protocol was specifically intended:

- to identify significant actual or potential risks at a facility
- to standardize inspections statewide
- to incorporate an integrated source reduction or pollution prevention orientation
- to support enforcement actions
- to be performed typically by a single inspector

In spring 1993, a joint DEP and EPA-New England (Region I) Waste Prevention FIRST Inspection Protocol Workgroup was formed. Experts from each of the waste medium programs from EPA and DEP (both programmatic and field staff) met. First, the group defined a three-level hierarchy of inspection protocols:

- "A", the most detailed, is a full audit of compliance and involves a complete evaluation of all aspects of facility compliance of all media and plant documentation;
- "B" is a compliance evaluation, an inspection of all media primarily to identify significant actual or potential risks at a facility; and
- "C" is a reconnaissance inspection to quickly identify imminent threats and significant violations.

Second, the group developed a detailed recommendation on the content of a Type B protocol, the FIRST CEI Protocol. Approximately 30 reviewers including inspectors from all DEP regional offices, EPA staff, and others commented on the recommendations in October 1993.

During summer 1994, DEP and EPA conducted pilot inspections using the FIRST CEI Protocol at 30 inspection sites. Approximately 15 inspectors attended a pilot training session in the use of the protocol in June and conducted the inspection in July and August. This became the basis for the final protocol document.

Additional background on DEP's move to designing, testing, and implementing a multimedia compliance inspection for commercial and industrial facilities is available in reports on the Blackstone Project.[1]

3.2 The FIRST CEI Protocol

FIRST field inspectors have been using the protocol to conduct almost all industrial and commercial facility inspections since it was introduced in November 1994.

The protocol guidance document was finalized on October 31, 1994 and is approximately 50 pages in length (see appendix)[2]. Additionally, a 3-inch training binder of supporting regulations and background materials was issued to each FIRST inspector. Although explicit updates have not been made since, separate guidances on new and changed regulations and on special programmatic inspection protocols and enforcement strategies are sent to the regional offices on an as-needed basis; field staff may include these materials in their binders, or may file them separately.

The protocol is organized by waste medium, following the regulations. It includes sections on air quality, hazardous waste, industrial wastewater (surface water, sewer, and groundwater), Massachusetts Toxics Use Reduction Act (TURA) requirements (chemical use reporting and reduction planning), solid waste (disposal activities only), in addition to guidance on identifying pollution prevention opportunities. It includes twenty specific step-by-step "Inspection Guidances": one general; ten air quality; three industrial wastewater; three hazardous waste; and one each for solid waste disposal, TURA, and pollution prevention. Most of the inspection guidances are two-part in nature. First are the specific items to look for; second is the "evaluation criteria" against which to test what was observed. These checklist style Inspection Guidances are intended to serve as reminders of the minimum elements of a whole-facility regulatory compliance inspection. Table 3-1 lists the inspection guidances.

The "On-Site Inspection Procedure" section instructs inspectors to, in order, conduct a detailed pre-inspection interview, tour the process area(s), tour the waste management area(s), review the plant's records, and conduct a post-inspection interview. "On-Site Inspection Activity" guidance asks inspectors to:

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[1] "FY90 Report on the Blackstone Project", Mass. DEP, July 23, 1990.

[2] Compliance Evaluation Inspection Protocol: Facility-Wide Inspections to Reduce the Source of Toxics (FIRST), October 31, 1994

- obtain missing information
- identify products produced by the facility
- conduct a general, non-process facility evaluation
- inspect each unit operation and major process step for process description and process flow diagram, general housekeeping conditions, input substances and quantities used, outputs, and waste streams (applies to all media, using the guidances)
- identify waste medium transfers, following the industrial wastewater treatment guidance
- tour the hazardous waste accumulation area, following the guidance
- perform record reviews for all media
- document severity of violations, if any
- communicate findings verbally to facility staff

Inspectors then follow standard BWP and DEP procedures for issuing enforcement actions, if any.

Table 3-1: Inspection Guidances

1. General Facility Evaluation: Not Media Specific

2. Air Quality: General (Non-process) Evaluation

3. Air Quality: Process - Approved Sources.

4. Air Quality: Process - Unapproved Coating and Printing

5. Air Quality: Process - Unapproved Degreasers

6. Air Quality: Process - Unapproved Combustion Sources

7. Air Quality: Process - Unapproved Plating Evaluation

8. Air Quality: Process - Unapproved General Process

9. Air Quality: Process - Unapproved Fabric Filter

10. Air Quality: Process - Unapproved Wet Scrubber

11. Air Quality: Record Review

12. Process Wastewater Stream Evaluation

13. Industrial Wastewater: Treatment Facility Evaluation

14. Industrial Wastewater: Record Review (for permitted discharges only)

15. Solid Waste Evaluation

16. Hazardous Waste: Process - VSQGs, SQGs, and LQGs

17. Hazardous Waste: Accumulation Area Evaluation - SQGs and LQGs

18. Hazardous Waste: Record Review

19. TURA: Record Review

20. Pollution Prevention

ADDENDA: additional training materials and training sessions were provided (either during the same period or subsequently during FY95 and FY96) for Stage II Fuel Dispensers, the Massachusetts Printers Partnership, the Toxics Use Reduction Program, and the Environmental Results Program.

4. Waste Prevention FIRST CEI: Training and Evaluation

4.1 Grant Proposal: Training

From the Compliance Assurance Demonstration Grant Proposal, dated 9/22/94:

> *"Output IV. Training*
>
> *DEP has an on-going effort to train staff (including refresher training and training in new technologies) in the requirements and specifics of the various programs."*

FY95 Milestones:	*Deadline*
Develop FIRST CEI Protocol training materials	*11/1/94*
Provide classroom training to all C/E staff on FIRST CEI Protocol	*1/1/95*
Provide field training to all C/E staff on FIRST CEI Protocol (1/2 of all C/E staff will need 6 observation-only/dry-run inspections w/ mentor)"	*4/1/95*

4.2 Training Implementation

4.2.1 Training Materials

The final FIRST CEI Protocol and accompanying training materials were developed by program representatives of the Boston C/E Team with additional input from the BWP regional C/E staff. The development of the protocol itself evolved from the time of the Blackstone Project in 1989 until its final version dated October 31, 1994; training materials were completed in November 1994. Both were completed by deadline.

The training manual is a comprehensive 600-page compilation of regulations, worksheets, checklists, reference sheets, case studies, guidance, the protocol itself, and examples. It is organized by regulatory waste media: air, hazardous waste, industrial wastewater, solid waste, and TURA, with an additional section on pollution prevention.

The introduction to the training manual states that it is "intended to be a compilation of reference material that will be most useful to FIRST field staff" and that it is "intended to be an evolving document, and the Boston C/E Team will attempt to provide periodic updates to all BWP regional C/E staff." In evaluations completed at the time, inspectors generally regarded the training materials as positive, except for the size of the manual ("huge", "heavy").

4.2.2 Classroom Training

Several training events occurred during 1994. Pilot training of approximately 15 inspectors from all regions was conducted in June 1994 in preparation for wider training on the FIRST CEI Protocol. Comments were solicited and received from inspectors participating in the pilot. Enforcement training was offered for all inspectors during 1994. Finally , classroom training was delivered over two days in November 1994 at a central location for inspectors from all regions. Approximately 50 inspectors attended the November training session.

The highly complex regulatory programs in air quality and hazardous waste were presented in separate forums to inspectors who had prior experience in these areas, and those who did not.

Inspectors completed written evaluations immediately after the November 1994 training sessions. They rated each training module on a scale of 1 to 5 with 1 meaning "least helpful" and 5 "most helpful". The overall assessment of the two-day training program was moderately high (3.6). General themes which emerged from the comments included a need for more industrial process knowledge, and additional training time and more specific information in each of the regulatory areas.

Additional classroom training since the initial November 1994 training has focused on multimedia inspections conducted to satisfy specific initiatives. Intensive training was provided on inspecting gasoline dispensers for vapor recovery equipment requirements (Stage II) and printers (for the Massachusetts Printers Partnership) in the context of the multimedia approach.

Inspectors hired since the November 1994 training have fared less well. The written training materials and guidance documents have been provided, but no general classroom instruction in conducting multimedia inspections (apart from that offered to meet special initiatives) has been made available.

4.2.3 Field Training

Field training did not occur as envisioned. The regional offices were responsible for this portion of the training. Inspectors from most regions reported in interviews (conducted during the summer of 1996) that there was no coordinated effort. It appears that only the Northeast Regional Office implemented this final part of the multimedia inspection training.

Inspectors hired since November 1994 have been trained almost entirely through informal, field "mentoring" approaches conducted on an as-needed basis by each regional office.

4.3 Evaluation of FIRST Protocol B

4.3.1 Methodology

Of the approximately 30 multimedia inspectors and 8 compliance and enforcement supervisors statewide, fifteen inspectors and one supervisor were informally surveyed between 7/23/96 and 8/6/96 to learn their impressions and experiences with conducting multimedia inspections at industrial facilities using the Facility-wide Inspections to Reduce the Source of Toxics (FIRST) Compliance Evaluation Inspection (CEI) Protocol B. Two inspectors from the Environmental Strike Force (ESF) and one staff member from the Office of Enforcement were also interviewed. This marks the first time a structured survey of inspectors about the protocol was conducted since its introduction.

The majority of inspectors were interviewed by phone and interviews generally ran thirty minutes. Two submitted their answers in writing, one provided additional comments in writing, and two were interviewed in person. Inspectors received the survey questions in advance so they could reflect on the questions. Additional questions were posed in later interviews as suggested by earlier respondents. The questions also provided a venue for unstructured comment and discussion. A copy of the final set of questions is attached. Tables 6-1a, 6-1b, and 6-1c contain the answers that could be quantified.

Inspectors were chosen from each region by their prior media of expertise. That is, one former single medium inspector from each of air, hazardous waste, industrial waste water, and TURA were chosen from each region. Additionally, a more recently hired inspector who had performed only multimedia inspections was surveyed from each region. Inspectors' years of experience ranged from six months to twenty years: the average amount of experience of all inspectors was 12.5 years.

4.4 Conclusions

Any conclusions and findings must be qualified with an awareness that a great deal of ambivalence remains in DEP regional offices and among some DEP Boston staff as to whether any type of multimedia inspection should have been attempted, and for what types of regulated entities it is or would be most effective. In this context of uneven acceptance at the conceptual level, ambivalent attitudes and responses prevail in formal and informal communications.

The following conclusions about the FIRST protocol were discovered through the interview process:

- the level of detail in the protocol is close to the intent of a level "B" inspection: detecting significant imminent or actual threats to human health or the environment

- the inspectors implementing the protocol may both find and miss certain violations in all programs; this may be both a training issue and a protocol design issue

- special areas of concern for inspectors are new regulations, TURA guidance, and industrial wastewater

- the protocol supports enforcement cases; concerns expressed by EPA, DEP senior management, and others about underperformance of enforcement are likely a training issue

- there are clear advantages and disadvantages of the multimedia approach from the inspectors' viewpoints, but more advantages are named than disadvantages

- additional and more frequent training may be needed in such areas as industrial production processes and work practices, pollution prevention and source reduction advances, and refresher training in waste medium regulatory requirements

- additional standardization of practices in implementing the inspection protocol should be considered, for example, statewide guidance on when to perform team inspections, or how to prepare inspection documentation

- broad application of the FIRST Protocol B should be reconsidered; after two years of statewide practice, evidence may be available for where the protocol is most effective, and where other inspection approaches could be more effective.

Additionally, although inadvertently overlooked in the survey and interview process, BWP management has heard reports that inspectors are still perplexed by the two roles they are expected to play: pollution prevention assistance provider and regulator compliance enforcer. Although managers may see a clear distinction between promoting general and specific pollution prevention activities and the assessment of regulatory compliance with its ensuing repercussions, many field staff seem genuinely unable to "wear both hats." This may be corrected by designating some inspectors as P2 information providers in addition to the compliance and enforcement role, by better training and clarification of roles and expectations for all staff, or by other approaches.

Multimedia inspections seem to be more effective than single medium inspections and to provide benefits that single medium inspections do not in that they:

- find more unregulated activity and more transfers between waste media
- find more violations
- provide more thorough inspections

- get the "whole picture" at the facility better than single medium inspections
- view the facility from the same perspective as facility staff (process-based) thereby improving communications with and cooperation from industry
- provide more inspections for wastewater activity (by including it in every inspection rather than targeting particular facilities for single-medium wastewater inspections)
- broaden the inspectors' experience and provide more variety and challenge
- don't allow compliance or enforcement issues to be lost between inspectors of different media

Multimedia inspections (as practiced by BWP) may be less effective than single medium inspections and may have drawbacks that single medium inspections do not in that:

- they are not as likely to provide as much depth as an inspection for a single waste medium
- they are more time-consuming (takes longer to do an inspection)
- less time is spent on each medium
- inspectors are expected to know details of every program and it is difficult to remain current on so many regulations
- they are difficult to perform effectively for large facilities
- fewer visits to particular large facilities occur since one inspection visit covers the needs that several separate inspectors previously may have.

When combined with BWP's flexible targeting approach, an additional potential drawback when compared to single medium, programmaticly-driven inspections is:

- fewer air and hazardous waste inspections occur statewide (that is, fewer targeted inspections of EPA priority sources or "majors" in these programs)

In interviews with inspectors conducted nearly two years subsequent to the FIRST protocol training, the following criticisms were offered, some of which were heard when the training was delivered and some new:

- not enough training at the time
- lack of hands-on training at sites in the field
- no experience on the part of the trainers in performing inspections
- lack of training for inspectors who have joined BWP since the protocol was developed
- absence of on-going training
- lack of follow-up field training subsequent to training sessions (see "Field Training", below)
- training should be geared toward different levels of inspectors
- training should be interactive

A few noted they would have liked training in each of the regions, though it was done centrally to streamline training resources. Inspectors would have liked longer and more comprehensive training, particularly in the media with which they were unfamiliar.

The specific interview findings are being considered within DEP to determine which results point toward a larger, underlying problem, and what corrective actions can be initiated to improve inspection and enforcement performance. Meanwhile, a training grant received from EPA's Environmental Technologies Initiative will meet some of the needs described above during FY97.

5. Resource Usage

An analysis of how the multimedia approach affects the use of BWP resources compared to the traditional approach was conducted for this document. Data for this analysis was gathered in two ways. First, time charges on time sheets of regional BWP inspectors were examined.[1] Second, inspector interviews were conducted in summer 1996 to learn from their experience.

5.1 Data from Regional Time Analysis

Data from time sheets for FY95 show that BWP multimedia inspectors averaged 59 inspections per year or 1.1 per week. From this, 34 hours per inspection is calculated.[2] BWP inspectors who do not perform the multimedia FIRST inspection protocol (asbestos, solid waste landfills, and other single-medium inspections performed for specific reasons) averaged 475 inspections per year or 9 per week. From this, 4 hours per inspection is calculated. Since multimedia inspections cover five media, it can be said that they consume 6.8 hours per medium compared to 4 hours per medium with single medium inspections. Additional data gathering and reporting requirements for multimedia inspections, in addition to seeking pollution prevention opportunities during the inspection may account in part for the larger time requirement. These data support inspectors' assertions in interviews that multimedia inspections are somewhat more time-consuming than single medium inspections. DEP managers, previously troubled by the assertion that FIRST inspections were unduly time-consuming and inefficient, determined that the difference was not significant enough to warrant further concern.

5.2 Data from Inspectors

The following results of interviews with BWP FIRST inspectors provide an understanding of the effort required to perform multimedia inspections.

5.2.1 Time required to perform pre-inspection preparation

This estimate includes gathering and analyzing the facility's previous inspection report, if any, and reviewing and photocopying any permits, data reports or other documentation. Variables affecting the time are the size and degree of organization of the file on the facility (reported by three inspectors), facility size (three inspectors), and number of media (one inspector). Another variable cited by two inspectors is the degree of complexity and the number of air program regulations (e.g., number of air permits) governing the facility. One said that a small facility with no file will consume almost no time. From interview answers, the following is estimated:

- Minimum for all facilities: 20 minutes; maximum for all facilities: 3 days
- Average for minor sources: 2-3 hours; average for major sources: 8 hours.

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[1] From a department memo entitled "BWP Regional Time Analysis for FY95", dated 3/8/96.

[2] Massachusetts DEP employees are paid for 37.5 hours per work week.

5.2.2 Time required at a facility to perform a FIRST inspection

This category does not include travel time, but otherwise includes all time spent on facility premises. Variables affecting the answer include whether it is a repeat visit, facility size, if there is a history of enforcement, how thorough and organized the previous inspection report is, and whether the inspection is announced or unannounced.

Travel time is an obvious source of time savings for multimedia as compared to separate single-medium inspections. Instead of three or more separate trips to a facility for each medium, only one trip is necessary for all media. Additional savings are realized from fewer phone calls, letters, and other facility contacts. From interview answers, the following is estimated:

- Average for all facilities: 3-5 hours
- Minimum for all facilities: 1 hour; maximum for all facilities: 5 days
- Average for small facilities: 1-3 hours; average for large facilities: 5-8 hours.

A counter-intuitive observation came from an inspector who said that smaller facilities often take longer than large sites because additional effort is spent educating facility staff (offering compliance assistance and pollution prevention information is part of an inspector's responsibilities).

5.2.3 Time required to complete post-inspection activity

This category includes writing the post-inspection report, issuing a Notice of Noncompliance (NON), if any (other enforcement actions are not included in this estimate as higher level enforcement requires considerably more time to prepare than an NON, and the NON is the most commonly issued form of enforcement), and reporting findings to the facility. Elapsed time was a significant issue in reporting this measure. That is, elapsed time can take up to a week or more, but actual time for these activities is much smaller. Elapsed time increases as increasingly higher level enforcement actions are involved.

It appears that average actual time to complete a post-inspection report is one to two hours. An additional half hour to an hour is required to write a NON (issued in more than two-thirds of cases). Higher level enforcement can take more time to prepare. Actual time elapsed before completion of post-inspection activity can range up to several days.

5.2.4 Time required to complete electronic reporting

This includes time to enter data into the Facility Master File (FMF), RCRIS, SSEIS, and a regional compliance and enforcement database (usually DBase3+), if the region maintains one. Variables are whether a facility is initially registered, or registered under

another name. It appears that the time required for electronic data reporting averages one to two hours for most inspectors provided there are no system access or facility registration problems.

More general responses relating to FMF and other electronic data systems reveal that the time inspectors spent for these activities increased significantly when FMF was introduced due to: 1) the unfamiliarity of inspectors with the new system; and 2) problems with the first versions. All inspectors report that the problems are being resolved and that they are increasingly comfortable with the datasystem. It can be concluded that the amount of effort expended on these activities is decreasing over time. Two inspectors said that FMF still has room for improvement, so it can be expected that this area will continue to improve.

5.2.5 Other comments

One inspector reported that there are now more "quick" inspections and more small facilities inspected. In past years, single medium inspections were not routinely done at small facilities, but using the multimedia protocol make them more worthwhile to pursue using the targeting flexibility offered through the grant. The Blackstone Project reported the same conclusions.[3]

[3] "FY90 Report on the Blackstone Project", p. 16, Mass. DEP, July 23, 1990.

6. Pollution Prevention

Pollution prevention (or source reduction or waste minimization) is an approach to improving environmental behavior complementary to pollution control. Where pollution control emphasizes cleaning up wastes, pollution prevention focuses on reducing or eliminating toxic substances before they are used in or generated by a process. Chemical substitution, recycling, and other means are employed. The definition of the term "source reduction" as it appears in the federal Pollution Prevention Act of 1990 provides a basis for common understanding:

"(42USC13102)(5)(A): The term "source reduction" means any practice which--

(i) reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal; and

(ii) reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.

The term includes equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.

(B) The term "source reduction" does not include any practice which alters the physical, chemical, or biological characteristics or the volume of a hazardous substance, pollutant, or contaminant through a process or activity which itself is not integral to and necessary for the production of a product or the providing of a service."

Massachusetts DEP's Bureau of Waste Prevention (BWP) actively encourages pollution prevention and source reduction at the commercial and industrial facilities it regulates. An integrated, rather than separate and isolated, orientation to pollution prevention is a fundamental BWP value. Pollution prevention plays a significant role in several of the bureau's activities including facility inspections, enforcement actions, and compliance initiatives. Since 1989, BWP has incorporated a pollution prevention orientation into all multimedia inspections; has coordinated activities with and promoted the services of the Massachusetts Office of Technical Assistance (OTA) and EPA's pollution prevention projects; and has aimed educational and inspection efforts at selected industries based, in part, on the potential for pollution prevention gains.

6.1 Inspections Include Observations for Pollution Prevention Opportunities

The Facility-wide Inspections to Reduce the Source of Toxics (FIRST) Compliance Evaluation Inspection (CEI) multimedia protocol used by BWP

facility inspectors directs inspectors to identify general and specific pollution prevention and source reduction opportunities at facilities. Inspectors focus on processes, evaluate each generation point, and are alert to any media transfers. The compliance assessment is conducted from a multimedia perspective and is therefore inclusive of finding the greatest number of pollution prevention opportunities. Facilities are provided with written materials referring them to the Office of Technical Assistance (OTA) for more information; facilities receiving Notices of Noncompliance (BWP's most common enforcement action) are explicitly referred to OTA and OTA receives a copy of the enforcement action in order to offer assistance.

6.2 Toxics Use Reduction Act

Massachusetts leads the nation in pollution prevention. Massachusetts was the first state in the nation to adopt source reduction legislation in 1989. The landmark Massachusetts Toxics Use Reduction Act (TURA) was signed into legislation in July 1989. By 1992, 25 more states had followed with legislation to reduce waste generation at the source and/or limit the use of toxic chemicals.[1]

TURA regulates the use of particular toxic chemicals, not just their handling and disposal. It mandates that businesses using or producing toxic chemicals above certain thresholds report their usage and write documents to plan for reducing usage. Since 1990, BWP field staff have inspected facilities for compliance with these regulations. Inspectors use the multimedia FIRST CEI protocol which includes inspection of companies' TURA planning and reporting compliance, in addition to the general inspection for pollution prevention opportunities.

Early results of the effectiveness of TURA regulations are encouraging. In a study to learn industry motivation for pursuing pollution prevention projects, EPA interviewed several Massachusetts companies. TURA was named in all cases as a factor in initiating pollution prevention planning.[2] A graduate thesis examined the effectiveness of U.S. and Massachusetts pollution prevention planning and reporting requirements.[3] Through interviews with Massachusetts industrial environmental managers, the authors found TURA rated higher than other regulatory factor in encouraging industrial facilities to initiate pollution prevention planning: 69% of interviewees rated it "highly effective". The reason given was the perception of enforcement: environmental managers were more

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[1] Brenda S. Davis and Barbara M. Greer, *Pollution Prevention: State Strategies for Industrial Change*, Princeton University Woodrow Wilson School of Public and International Affairs, p. x, 1993.

[2] *Prototype Study of Industry Motivation for Pollution Prevention*, U.S. EPA, EPA 100-R-96-001, June 1996; Interview Results, U.S. EPA, EPA 100-R-96-001a, June 1996.

[3] Susan Gouchoe, Michael James, Kevin Lynch, Marcia Rose, and Shawn Usher, *Evaluation of the Effectiveness of Industry Pollution Prevention Planning Requirements and Guidance for Integrating Pollution Prevention Plans*, thesis for M.S. degree, Tufts University, November 1994.

apt to consider pollution prevention approaches if compliance with environmental regulations in some way required them to do so.

Most recently available data on TURA are from 1994.[4] They show the program is working. Reported chemical use dropped by 17% between 1990 and 1994 and overall byproduct generation decreased 16% during the same period. The top twenty byproduct generators were responsible for a 29% reduction. Of companies filing in 1993, 55 were no longer required to file in 1994 because in most cases their usage dropped below reporting thresholds. This is the intended result of the TURA program. In a few cases, filers dropped out due to plant closure.

6.3 Office of Technical Assistance

The Central Massachusetts Pollution Prevention Project (CMPPP) began in 1989 in conjunction with the Blackstone Project. Through this program, the Department of Environmental Management (DEM), a sister agency of DEP, provided technical assistance to companies participating in the Blackstone Project through the Office of Safe Waste Management. This project served as a prototype for the subsequent creation of OTA mandated by TURA legislation passed the same year.

The OTA was created as a partner agency of DEP and is structured as a source of free and confidential assistance for facilities. It provides on-site visits and phone consultations to help facilities identify source reduction opportunities and achieve compliance. It conducts workshops and seminars and initiates industry specific efforts.

Early responses from businesses using OTA services were positive. An independent consulting firm interviewed companies with contact with OTA during the CMPPP pilot to learn their perceptions of the agency.[5] Eighty-seven percent (87%) of the firms receiving on-site assistance from OTA or attending an OTA workshop initiated toxics use reduction measures, as opposed to only 39% of similar firms in the same region during the same period. Over 50% of companies that received OTA services said OTA influenced their decision to make reductions.

The CMPPP pilot was additionally noteworthy in that the linkage between OTA technical assistance and DEP regulatory activities was very tight. Facilities were encouraged by regulatory staff to contact OTA for technical assistance. This appears to have served as a strong incentive to facilities to avail themselves of

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[4] "Massachusetts Toxics Use Reduction Program: 1994 Data Release", Mass. DEP, January 1996.

[5] Timothy J. Greiner, Massachusetts Office of Technical Assistance for Toxics Use Reduction, *The Central Massachusetts Pollution Prevention Project: Summary Report.*

OTA's services, encouraging BWP to continue with this approach to P2 promotion. In addition, the CMPPP pilot found that the average toxics use reduction per facility was 22.3 tons (44,600 lbs). More recent data from OTA indicate the average toxics use reduction per facility for the approximately 700 facilities which received technical assistance was 18.5 tons (37,000 lbs).[6] This figure is important because about half of the 700 facilities which received OTA assistance were not Large Quantity Toxics Users subject to TURA regulations. The CMPPP pilot found that average savings per facility was $30,000.

6.4 BWP and OTA: Partners in P2

BWP coordinates with OTA by referring facilities and OTA to each other using a standard process. When BWP field staff identify source reduction opportunities during an inspection, they routinely refer the facility to the services of OTA. When an inspector finds a violation during a facility inspection, a written notice citing the violations, called a Notice of Noncompliance (NON), may be issued to the facility (when DEP guidance does not call for higher level enforcement). BWP policy requires an accompanying cover letter. The cover letter is designed as a standard template with placeholders. BWP Policy #BWP-95-012, "Standard Cover Letter for All Notices of Noncompliance" which contains this letter was finalized in August 1995. The letter:

- promotes the source reduction philosophy
- includes an optional paragraph citing specific source reduction possibilities for the facility found during inspection
- promotes OTA as a source of free and confidential assistance to achieve compliance and gives contact information

BWP also provides OTA with a copy of the NON (and other enforcement documents) so OTA staff may contact the facility to offer their expertise.

Exhibit 6-1 shows BWP's use of cover letters sent in promoting pollution prevention. These data for FY95 Q1-Q2 constitute a snapshot of BWP activity during a six month period, showing that 69% of enforcement notices issued during this time were accompanied by some level of education on pollution prevention.[7] Note that this activity occurred before the policy was still circulating internally as draft, so it is likely that the use of cover letters has increased.

Exhibit 6-1: Notice of Noncompliance Cover Letter Usage (FY95 Q1-Q2)[8]

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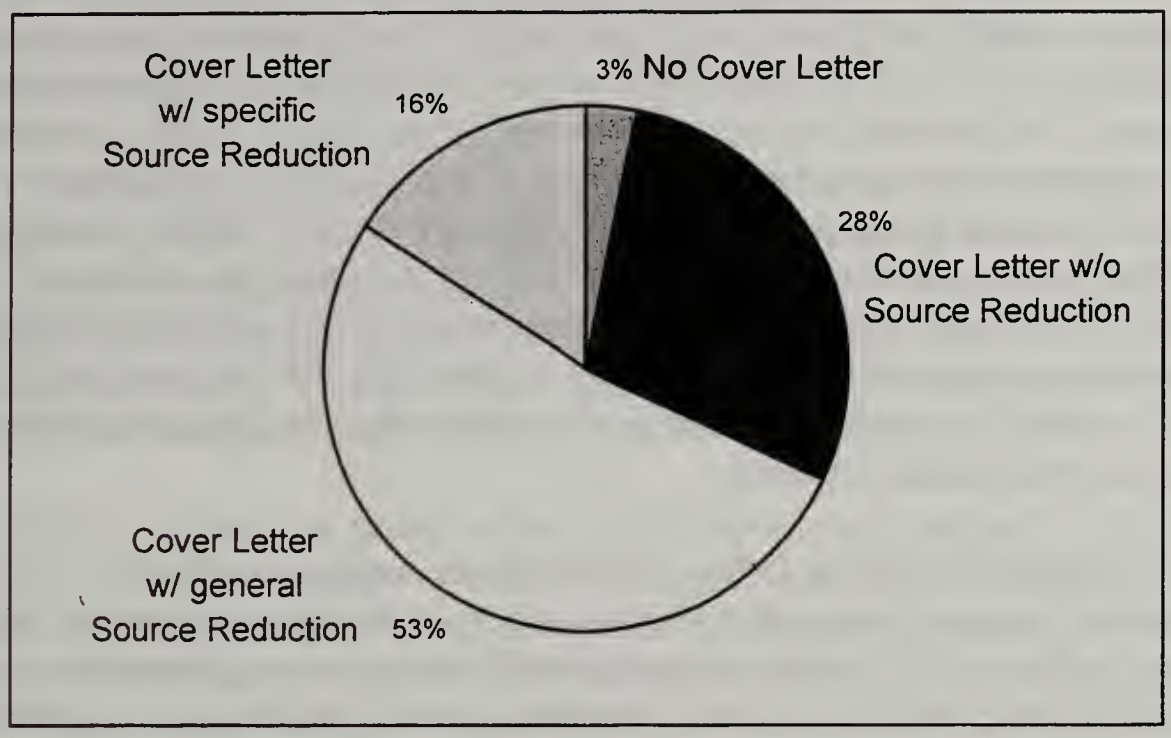
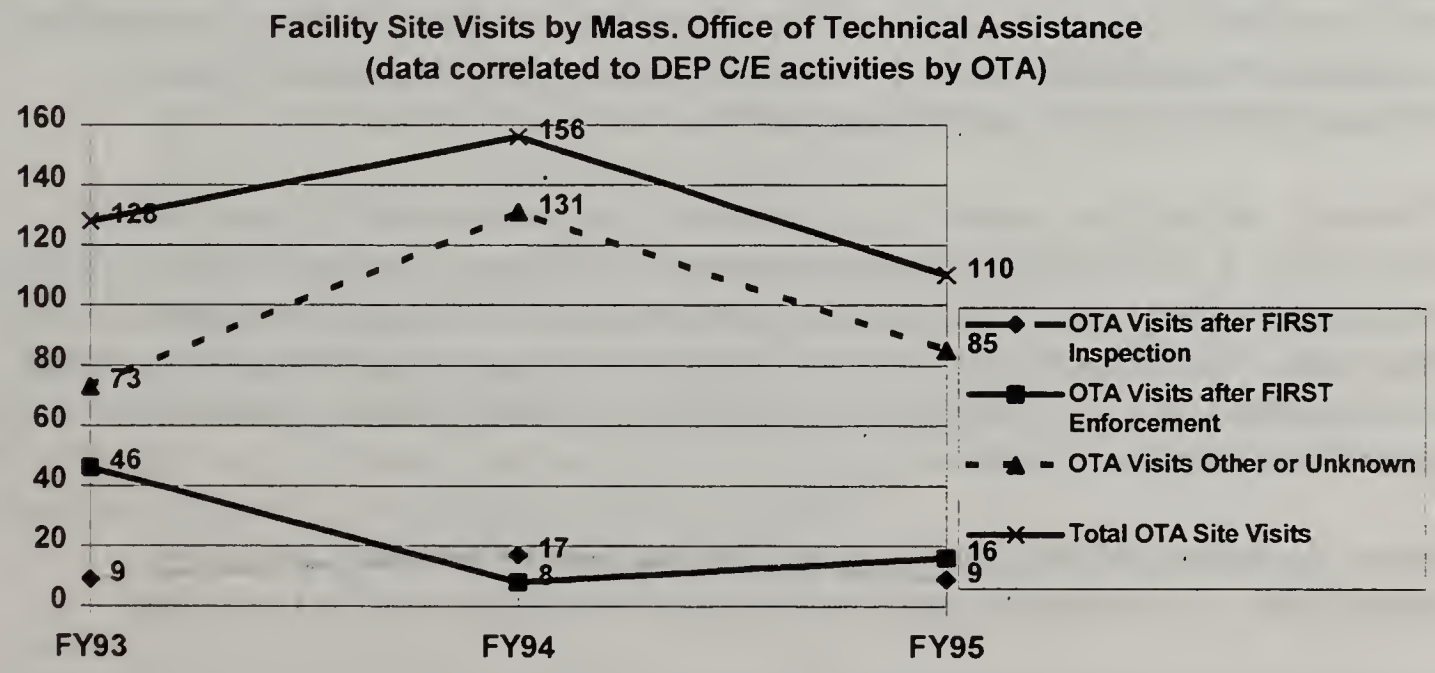
[6] R.Riebstein letter dated December 9, 1996.
[7] The FY95 Q1-Q2 data was gathered from the paper files at the DEP Office of Enforcement in Boston.
[8] Source: summary sheet dated October 26, 1995 in BWP OPI file "OTA Site Visits".

Exhibit 6-1: Notice of Noncompliance Cover Letter Usage (FY95 Q1-Q2)[8]



Actual OTA site visit data and the relation to FIRST inspection and enforcement activity for three years are shown in Exhibit 6-2 (data were not yet available for FY96). Note that these numbers reflect only technical assistance site visits by OTA staff and do not include the assistance that OTA provides over the phone to customers. It appears that BWP generates about 27% of OTA's annual site visit referrals, on average.

Exhibit 6-2[9]



[8] Source: summary sheet dated October 26, 1995 in BWP OPI file "OTA Site Visits".
[9] Source of FY94/FY95 numbers: BWP OPI file "OTA Site Visits".

Since BWP conducts approximately 1,000 commercial or industrial facility inspections per year, and issues enforcement actions of some type against approximately 500 to 700 of these facilities, the number of contacts between industry and OTA appears to be relatively low. The causes of this low level of activity continue to be explored; EPA's study of industrial motivations for pollution prevention is one on-going project researching this issue.[10] BWP continues to explore other, more effective means of promoting pollution prevention at industrial sources including the use of Supplemental Environmental Projects (SEPs) in enforcement, and is encouraged by the CMPPP pilot results (above) that each pollution prevention assistance contact with a facility can result in significant environmental benefits.

The U.S. General Accounting Office conducted an assessment of Massachusetts' approach to pollution prevention in which it interviewed officials at participating firms.[11] Company representatives at two small facilities reported that multimedia inspections, coupled with the technical assistance provided by OTA, contributed to source reduction at their facilities. In one example, an electroplating company gained an awareness of pollution prevention from inspectors and OTA. It now anticipates replacing a hazardous chemical with a nonhazardous substance which will reduce its annual compliance fees with a downgrade in status to a small quantity rather than large quantity hazardous waste generator.

6.5 Other Factors and Programs

The Pollution Prevention Act of 1990 established as national policy that pollution be prevented or reduced at the source whenever possible. Pollution prevention, as opposed to pollution control, was articulated as the preferred method of addressing the nation's pollution problems.

Voluntary, rather than regulatory, programs to motivate industry have proved successful. EPA's "33/50" Program begun in 1988 was a nonregulatory, voluntary program meant to reduce overall risk from 17 high-priority toxic chemicals. Participating companies pledged to reduce emissions and transfers of these chemicals by 33% by 1992 and 50% by 1995. These goals were passed ahead of schedule.

Some regulations effectively force companies to seek pollution prevention alternatives. For example, many wastewater discharge permits under the

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[10] *Prototype Study of Industry Motivation for Pollution Prevention*, U.S. EPA, EPA 100-R-96-001, June 1996; Interview Results, U.S. EPA, EPA 100-R-96-001a, June 1996.

[11] "Environmental Management: An Integrated Approach Could Reduce Pollution and Increase Regulatory Efficiency", U.S. General Accounting Office, January 1996, GAO/RCED-96-41.

National Pollutant Discharge Elimination System (NPDES) set such strict limits on the concentration of certain chemicals in wastewater discharges that some companies must look at zero-discharge technology such as 100% recycling of wastewater instead of treatment.

Other encouragement comes from industry by way of industry publications and trade groups which are increasingly promoting environmental compliance. For example, the printing industry's *Graphic Arts Monthly* reported on industry environmental compliance initiatives and provided information on the availability of new printing industry environmental compliance tools including seminars, workshops, and on-line computer services.[12]

More generally, economics gives further incentive for companies to pursue pollution prevention measures. Process changes, including chemical substitution and in-plant recycling, often prove far less expensive than removing contaminants from highly diluted or complex air or water streams at the end of a process. Moreover, recovery of usable byproducts and elimination of solid waste disposal costs typically improve the economics. Advances in technology make compliance strategies more effective, more affordable or both.[13] A few examples of common violations and source reduction strategies that can solve the problem economically:

- TURA non-filing and lack of air permit for TCE degreasing: eliminate TCE use by converting to an aqueous cleaning system

- lack of air permit for VOCs in printing inks: eliminate the need for a permit by switching to low VOC inks such as soy-based products

- illegal treatment of hazardous plating waste by evaporation: shut off evaporator and cut hazardous waste generation through plating line drag-out reduction and bath management

For example, a large machine tool manufacturing facility in central Massachusetts used TCE, a toxic solvent, to clean oil from metal parts. After a multimedia inspection and working with OTA, the company replaced the solvent with mineral spirits. Officials estimated that this substitution saves more than $18,000 annually, improves worker safety, and assures environmental compliance without compromising product quality.[14]

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[12] "Attacking Compliance: Resources for Printers Seeking to Comply with Environmental Regulations", *Graphic Arts Monthly*, August 1994.
[13] "Pollution Solutions", *Industry Week*, April 4, 1994.
[14] "Where Everybody Wins: The Blackstone Project Helps Companies Cut Their Use of Toxics", *Worcester Business Journal*, Vol. 3, No. 4, April 27-May 10, 1992.

6.6 Local Results

Pollution prevention has played a key role in Massachusetts in reducing pollution as industries reduce the use of toxic chemicals in industrial processes, according to the EPA. When EPA Region I reported that Massachusetts manufacturers reduced the amount of pollutants emitted into the environment by 68% between 1988 and 1994, EPA officials were quoted as attributing most of the decline to pollution prevention measures including source reduction and recycling activity.[15] EPA Regional Administrator John DeVillars said, "It's a reflection of the increased know-how on the part of New England on how to prevent pollution."

When the EPA solicited companies nationwide in 1988 to voluntarily reduce the use and release of seventeen priority Toxic Release Inventory (TRI) chemicals 33% by 1992 and 50% by 1995, participating New England facilities went faster and further than the rest of the nation. By 1992, they had already achieved a 55% reduction in toxic chemical releases and transfers. They reduced at twice the national rate (15.3% vs. 7.8%) and 50% faster than the national rate.[16] Another successful EPA program, "Green Lights", recruited 140 New England participants. Together they reduced electricity usage by 57 million kilowatts and $5 million dollars per year and reduced air emissions equivalent to 30,000 cars.[17]

6.7 Conclusions

Pollution prevention has been a focus of government since the late 1980s and industry has begun to adopt pollution prevention measures. Industry's interest can be attributed to the combination of the following factors:

- legislation and regulation with effective enforcement (e.g., Massachusetts TURA legislation backed by BWP's inspection and enforcement activity)

- education and support from all sectors (Massachusetts DEP and OTA, EPA voluntary programs, industry groups and publications, etc.)

- economics: made possible, in part, by new cost-effective technologies which can result in significant process cost savings and can limit facilities' potential liability exposure (via improved worker safety and reduced hazardous materials generation).

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[15] "Manufacturing Pollution Down Sharply", *Boston Globe*, June 27, 1996.
[16] *The State of the New England Environment 1970-1995: A Report of Our Environmental Quality for the 25th Anniversary of Earth Day*, U.S. EPA Region I.
[17] Ibid.

One example illustrates how an enforcement threat, the offer of free technical assistance, and economics combined to make one company act. A southeastern Massachusetts company was out of compliance with its water discharge permit, discharging 500,000 gallons of wastewater a week into a nearby stream. Instead of installing a conventional wastewater treatment facility, the company chose to work with OTA to develop a system to recycle close to 100% of the water back into the manufacturing process. The new system cost 75% less to build and 80% less to operate than a conventional treatment plant and the discharge was reduced to 500 gallons of water each week.[18]

Using average figures from OTA and the CMPPP pilot, BWP's enforcement referral activities for FY95 alone may be said to be responsible for reductions of about 407 tons of toxics, and cost savings to industry of about $660,000.[19]

BWP will continue to pursue more effective means of providing incentives and information to businesses about instituting pollution prevention projects.

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[18] Ibid.

[19] In FY95, 25 facilities referred to OTA received site visits. Estimate that 87% of referred facilities enact toxics use reduction projects resulting in savings of 18.5 tons and $30,000 per facility.

7. Two Pilot Projects

During the Compliance Assurance Demonstration Grant period, BWP undertook two innovative compliance and enforcement pilot projects. These were Fuel Dispensers and the Printers Partnership.

The projects were similar in that:

- a statistical sampling approach was used to measure behavior in an industry with many hundreds of similar sources before and after other BWP activities, providing an objective analysis of the effectiveness of each project
- compliance assistance and other efforts were performed during the period between the two rounds of statistical sampling inspections
- the inspection process was used to determine regulatory compliance, but was also used as a programmatic data-gathering tool
- they were the first projects to address industry groups which have many hundreds of sources with similar manufacturing or commercial processes

7.1 Fuel Dispensers

The eastern portion of Massachusetts is designated a federal non-attainment area for ground-level ozone air quality conditions. In order to try to achieve the national ambient air quality standards, BWP submitted to EPA a State Implementation Plan (SIP) listing many activities to be undertaken. One of the activities was a compliance and enforcement program directed at fuel dispensers, specifically to determine their compliance with Stage II Vapor Recovery System requirements as a means to reduce VOC emissions, a precursor to ozone formation. This project also was submitted in the Compliance Assurance Demonstration Grant.

7.1.1 Fuel Dispensers: Approach

Following the EPA's Small Source VOC Strategy, BWP determined a statistically meaningful, randomly selected sample of fuel dispensers. BWP performed FIRST inspections with additional guidance specific to compliance determinations at these facilities. Then, BWP performed a compliance assistance outreach project, targeting both individual facility operators and, where affiliated, larger parent corporations. Compliance assistance materials were specifically geared to the two separate audiences. These materials were modified for use in Massachusetts from materials originally used in California. A telephone hotline was also established to provide technical assistance to the facilities. Finally, BWP performed a comparable statistically meaningful, randomly selected sample of the same universe of fuel dispensers.

In brief, the statistical random sample approach uses an equation which determines the sample size for a particular confidence level for a binomial distribution of outcomes. That is, fuel dispensers are either in compliance, or not in compliance. The size of the sample is determined by the proportions of those two outcomes, the confidence level (i.e., "repeatability") of the answer, and the precision of the answer. Thus, 124 fuel dispensers were inspected both before and after the compliance assistance outreach activities in order to achieve a 99 % level of confidence in the outcome with 10% reliability (or precision), assuming an initial binomial distribution of 70% compliance and 30% noncompliance in the overall population. (This is similar to political polls determining which of two candidates will win an election, plus or minus the precision factor. The 99% confidence level means that a sample of this size could be drawn from the population 99 times out of 100 with the same results. The 10% reliability means that each factor of the binomial distribution is plus or minus 10%. That is, a 70% compliance rate actually could be 60% to 80% and a 30% noncompliance rate actually could be 20% to 40%.)

7.1.2 Fuel Dispensers: Outcome

The initial rate of noncompliance among fuel dispensers was determined to be 49% during Round I inspections (in fiscal year 1995). Following the compliance assistance phase, the final rate of noncompliance among fuel dispensers was determined to be 70% during Round II inspections (in fiscal year 1996). This counter-intuitive outcome is due to additional training provided to inspectors between the two inspection rounds in addition to the effects of the compliance assistance activities. During programmatic analysis of the detailed results of Round I inspections, it was determined that inspectors were not performing a sufficiently detailed investigation of the Stage II vapor recovery system components for BWP to evaluate reductions in VOCs. Therefore, additional intensive training was provided to inspectors who would perform the Round II inspections. As a result, the final set of inspections found more noncompliance than the first set of inspections. This is therefore attributable to inefficiency in the first round of inspections. (More detailed evaluations of the specific VOC reductions for various types of Stage II equipment will be presented in SEP discussions with EPA-New England.)

7.2 Printers Partnership

The Printing Industry of New England (PINE) contacted BWP to offer its assistance in reformatting regulatory requirements and compliance assistance materials in order to improve environmental behavior among its members. The premise was that the industry would help to determine high but attainable performance standards communicated in language understandable to printing shop owners. This approach, combined with self-certification to the performance

standards by printing shop owners, would result in improved environmental behavior.

The Printers Partnership was different from the Fuel Dispensers project in that printers were invited to join the partnership voluntarily, and a enforcement forbearance period was used as an incentive for joining. Additionally, certain permit types were waived in return for self-certifying compliance with the new performance standards.

7.2.1 Printers: Approach

Following a standard statistical equation for determining binomial distribution in a sample of a population, BWP determined that 50 inspections would be required both before and after the compliance assistance and self-certification phase. This value was calculated to measure an improvement of 15% from "before" to "after" at a 95% confidence level. (By comparison, the fuel dispensers project could measure only a 20% or better improvement, due to the reliability factor of 10% on each round of inspections. Mathematical analysis showed that the two seemingly different equations actually resolved to the same variables.)

BWP worked very closely with industry representatives throughout the project. In return, industry was very forthcoming about the level of performance to which a "good" printing business could be held accountable. PINE was also extremely helpful in organizing a workbook which assisted printers in correctly completing a self-certification document. For certain printers, the self-certification replaced some otherwise applicable permits. The workbook and self-certification questions were organized according to the logical steps in the printing process, as well as phrased in language that was understandable to printers. For example, rather than calculating pounds of VOCs emitted, printers who self-certified reported usage of certain VOC-containing chemicals, which directly correlates to VOC emissions. BWP, PINE and the Office of Technical Assistance offered seminars, workshops, and on-site assistance during the self-certification period.

In addition, a series of questions about non-regulatory and regulatory "good" environmental behavior was answered by inspectors as information additional to the compliance inspection results. Of these, 19 Environmental Behavior Indicators were determined, some of which directly related to regulatory requirements and some of which did not (for example, good housekeeping and pollution prevention activities).

7.2.2 Printers: Outcome

Participation by industry increased. Printers previously unknown to BWP stepped forward to self-certify compliance with the new performance standards.

Also, the environmental risk posed by the sector was more accurately characterized. With self-reported data on usage of VOC-containing chemicals, BWP could more accurately estimate the VOC emissions generated by this industry.

The rate of compliance with environmental regulations was seen to decrease, although not greatly, from Round I to Round II. It is unknown as to whether this may be a result of greater inspector scrutiny and suspicion of printers who self-certified compliance in the "after" pool, since the self-certification approach was as novel to the traditional enforcement staff as to the printers themselves. But the Environmental Behavior Indicators performance improved significantly from Round I to Round II.

Finally, the self-certification of compliance with the performance standards was generally validated. Only a minority of facilities inappropriately or erroneously certified that they were in compliance and would remain in compliance with the standards. This confirmed BWP's and PINE's hypothesis that requiring business owners to certify compliance to specific standards, in conjunction with extensive compliance assistance on what standards were applicable, would result in improved environmental performance of the industry sector overall.

7.3 Conclusions

Compliance assistance combined with traditional enforcement can be very effective in some sectors. Vitally important to the success of such efforts, however, are:

- effective incentives for participation (a meaningful threat of swift and sure enforcement is one effective incentive);
- thorough staff training prior to initiating baseline measurements of industry performance;
- detailed knowledge of the industry sector (for example, industries which commonly have transient ownership of facilities and little contact with written materials may not be good candidates for technical workbooks);
- careful selection of performance measures by which the success of the project will be determined.

8. Measures of Success

8.1 Grant Proposal

From the Compliance Assurance Demonstration Grant Proposal, dated 9/22/94:

> *"Output VI. C. Alternate Measures of Success (FMF)*
>
> *During FY95 and FY96, DEP will develop and pilot a number of new measures to evaluate the success of DEP compliance assurance activity. The measures include environmental yield-indicators at the facility level which can be linked to specific actions taken by DEP, as well as broader, state-wide environmental indicators of the aggregate benefits of DEP activity. DEP is developing the capability to record some of these measures in FMF. C/E-related measures under consideration for FMF include: formerly unregistered waste streams found, waste streams ended, and emissions reduced."*

8.2 Status

The Massachusetts Department of Environmental Protection's (DEP) Bureau of Waste Prevention (BWP) is developing new ways to measure the environmental impacts of its compliance and enforcement efforts, beyond the traditional approach of counting the number of inspections and enforcement actions. New Measures of Success are being developed to learn more about the relationship between DEP's inspection activities and specific changes in pollutant releases. This new approach will help DEP determine the validity of its assumptions about the inspection process. Work on Measures of Success started in the spring of 1995. The program has grown from the conceptual stage to preliminary guidance.

In spring 1995 BWP's OPI Permit team and Compliance and Enforcement team separately developed new Measures of Success. These came together in summer 1995 when an interim guidance was issued (July 20, 1995). Measures were divided into Phase I and Phase II, with Phase II measures all requiring substantial changes to systems and/or procedures. The guidance included methods of calculating the Phase I measures. This document mainly addressed the new measures at a policy level.

In August 1995, a task force (known as the "Test Group"), composed mainly of regional operations staff, was assigned to review and revise the interim guidance. They met during the fall of 1995 and issued revised guidance within a few months (Measures of Success, BWP policy # BWP-95-007). The task force concentrated on the implementation level of the Measures of Success.

Subsequently, the task force received comments by the DEP Office of Enforcement, the Office of Research and Standards and regional operations staff. These comments were to be incorporated into a final document. Once the draft policy becomes final, regional and Boston staff will be able to use all the Phase I new measures.

The individual Measures of Success are calculated in different ways. Some measures are already collected as a by-product of other reporting requirements and mechanisms. Others require changes to tracking systems and regional procedures before they can be implemented: an example is a measure that requires gathering and inputting new data into the Facility Master File (FMF).

BWP is collecting data for elements of the program already in place. These include the amount of landfill leachate prevented due to landfill closure, facility compliance rate, facility return-to-compliance rate, penalties assessed and collected, the amount of mitigated penalties invested in source reduction or pollution prevention activities, and possibly the reduction in the volume of hazardous waste transported.

BWP also collects information for assessing the effectiveness of its multimedia inspection protocol and flexible inspection targeting. These environmental outcome measures include rates of detection of "outlaws" (facilities discovered to have unpermitted, unregistered, or unlicensed activity in one or more program areas) and "multimedia hit" rates (enforcement actions describing violations in more than one waste media program area) for each of the flexible targeting initiatives each year. These data are described in more detail in the INSPECTION AND ENFORCEMENT TRENDS AND ANALYSIS section. These environmental outcome measures are used routinely by BWP and were not explicitly included in the Measures of Success project.

8.3 Future Efforts

Although the MOS project has proved more difficult than originally envisioned, progress is clear. Without dedicated resources to developing and testing the new measures, competing demands reduced the focus on this project. DEP remains committed to the development of measures of success and other environmental indicators: agency-wide measures of success is one of the goals the Commissioner has stated as a priority for DEP in FY 1997 and 1998.

BWP has also participated in the New England Goals and Indicators (NEGIP) project, and in efforts by EPA to determine national environmental indicators during the period of the Demonstration Grant. These activities also will continue to be actively pursued.

9. State of our Environment

9.1 Improving Conditions: Formal Reports

Data from recent years show that industries and businesses that once polluted the air, waterways, groundwater, oceans, and land have decreased toxic emissions dramatically. Massachusetts and New England are leading the nation in reducing pollution.

Air Quality: EPA reports in its National Air Quality and Emissions Trends Report 1994 declining emissions in six categories from 1985-1994: an 86% decline in lead levels in the air, nitrogen dioxide levels down 9%, ground-level ozone down 12%, particulate matter such as dirt, dust, and soot down 20%, a carbon monoxide decrease of 28%, and a 26% decrease in sulfur dioxide.[1]

The Worldwatch Institute, a watchdog organization on worldwide environmental and energy trends, reported in its annual *Vital Signs 1994*[2] that worldwide production of ozone-depleting chlorofluorocarbons (CFCs) fell 60% between the peak in 1988 and 1993. Coal use, a source of carbon monoxide in the air, continues to slowly decline: worldwide use dropped 5% between 1989 and 1993.

Water Quality: Industry, once the major source of water pollution ("point discharges"), continues to decrease its release of pollutants. Industry now accounts for less than 15% of pollutants entering New England's waters (compared to 20% nationwide).[3]

Hazardous Waste: EPA Region I New England reported that Massachusetts manufacturers reduced the amount of pollutants released into the environment by 68% between 1988 and 1994 compared to a 44% drop nationwide (New England: 67%). New England's reduction is greater than any other region in the nation. Toxic emissions registered 15% less in 1994 than in 1993, compared to a 8.5% decrease nationwide.[4]

The EPA reported in its 1992 TRI[5] a nationwide 30% overall decline in toxic chemical waste releases between 1988 (the year EPA began collecting statistics) and 1992. The one-year decline from 1991 to 1992 was 9%.

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[1] *EPA's National Air Quality and Emissions Trends Report 1994*, U.S. EPA.
[2] *Vital Signs 1994*, Worldwatch Institute.
[3] *The State of the New England Environment 1970-1995: A Report of Our Environmental Quality for the 25th Anniversary of Earth Day*, U.S. EPA Region I.
[4] "Massachusetts Companies Reduce Toxic Releases 15% in Single Year, Continue to Best National Average", *Environmental News*, Release #96-6-21, June 26, 1996, U.S. EPA Region I.
[5] EPA's 1992 Toxics Release Inventory, U.S. EPA.

9.2 Improving Conditions: Other Evidence

Generally, DEP BWP is not finding violations at the same rate it once did among large sources and facilities that have been regulated and inspected for several years. Newer businesses,[6] smaller sources, and newly regulated sources are more likely to be out of compliance. For example, 36% of EPA air quality national priority sources[7] inspected by DEP in FY 1995 received enforcements compared to 54% of all inspections that year (33% fewer). Additionally, an inspector on the Environmental Strike Force reports that the trend is away from blatant violations: less "midnight dumping" occurs now.

The increasing professionalism and accreditation of environmental managers and the development of ISO 14000 standards also broadly indicate the general level of awareness of and interest in protecting the environment among businesses which did not routinely possess such an agenda in prior times. Such an interest may be motivated by reducing worker health and safety liabilities, hazardous waste generation liabilities or production costs as much as by a purist "environmental ethic." Nevertheless, focus in protecting public health and the environment continues to move toward less obvious, more insidious threats such as ground-level ozone, increasingly smaller particulate matter size, and persistent and mobile toxic substances such as mercury.

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[6] "New" facilties are defined as operating five years or less.
[7] These facilities had a history of compliance and were skipped in FY 1994 for inspections.

10. TIMELINE

The following is a brief history of the Bureau of Waste Prevention's compliance and enforcement related activity pertaining to commercial and industrial sources of pollution. BWP also regulates other potential pollution sources (for example, asbestos abatement projects and solid waste landfills and transfer stations) which are not discussed here as they were not activity areas included in the multimedia Waste Prevention FIRST inspection protocol, or the Compliance Assurance Demonstration Grant.

1987 Blackstone Project first proposed in pursuit of one of DEP's FY87 goals:

"Exploration and, as appropriate, application of source reduction and other appropriate control techniques to reduce VOC emissions in order to comply with Ambient Air Quality Standards for ozone and to control emissions of air toxics."[1]

Source Reduction Policy Workgroup established to develop a response to proposed Massachusetts Toxics Use Reduction Act (TURA) legislation.

1988 Blackstone program concepts refined; funding sought and secured.

1989 Blackstone Project begun in the Central Region to pilot the use of multimedia inspections.

Central Massachusetts Pollution Prevention Project (CMPPP) conducted by Massachusetts Department of Environmental Management (DEM) in conjunction with the Blackstone Project (became the prototype for Massachusetts Office of Technical Assistance [OTA]).

Office of Enforcement in DEP's Boston office was created: single oversight authority to coordinate enforcement activities statewide and throughout DEP's regulatory programs.

Bureau of Waste Prevention (BWP) created: majority of regulatory activity relating to commercial and industrial pollution sources

[1] Memorandum from DEP Commissioner S. Russell Sylva to Deputy Commissioners, Division Directors, Regional Engineers, Program Managers, Legal Office, "Priority Objectives FY87 and FY88", July 9, 1986 (Internal Memorandum).

	organized in one DEP bureau (other bureaus are Bureau of Waste Site Cleanup dealing with remediation of sites contaminated with oil and hazardous waste and Bureau of Resource Protection dealing with wetlands, waterways, drinking water supply, and sanitary waste treatment regulations).
	Environmental Strike Force (ESF) created: special compliance and enforcement unit authorized to conduct investigations of possible noncompliance with any DEP regulations which may lead to civil or criminal prosecution by the Massachusetts Attorney General (AG).
	Enforcement Case Screening Committee (CSC) created: meets monthly to discuss and decide appropriate higher level enforcement actions, penalties, and referrals to U.S. Environmental Protection Agency of Massachusetts Attorney General for cases referred by regions.
Jul 1989	Massachusetts Toxic Use Reduction Act (TURA) passed by state legislature. Specific sizes and types of facilities which use large quantities of toxic chemicals on a regulated list are required to plan for the reduction of the use of these substances, report use data, and pay use fees.
Late 1989	Massachusetts Office of Technical Assistance (OTA) created within the Massachusetts Executive Office of Environmental Affairs (EOEA-a state cabinet office) as part of TURA program.
1990	Phase I of Blackstone Project: 28 facilities chosen for inspection.
	United States Pollution Prevention Act passes (federal legislation).
1990-1991	Phase II of Blackstone Project: expanded to 90 facilities, including 27 from Phase I.
1991	Blackstone Project is 1991 Winner of Ford Foundation's Innovations in State and Local Government Award, with a $100,000 cash grant.
1992	Multimedia inspections implemented on a limited basis in all regions.
	Facility Master File (FMF) developed as a facility-based, cross-media, statewide database.

1993	Development of Facility-wide Inspections to Reduce the Source of Toxics (FIRST) Compliance Evaluation Inspection (CEI) Protocol "B" as a joint effort between BWP and EPA-New England. FIRST Protocol "B" covers compliance with solid waste, hazardous waste, industrial wastewater, air quality, and TURA regulations from the perspective of potential or actual immediate risks to human health or the environment, and promotes pollution prevention as the preferred means for obtaining regulatory compliance. Functional reorganization of BWP to reflect the multimedia philosophy: regional offices combined all inspection staff into one multimedia unit; in Boston, the Office of Program Integration (OPI) was created to coordinate all waste medium programs and to promote pollution prevention. Cross-program permitting and compliance/enforcement teams established in Boston. Permit Coordinator and Compliance/Enforcement Coordinator begin to meet monthly with BWP regional operations Permit Chiefs and Compliance/Enforcement Chiefs, respectively. Full-scale implementation of multimedia inspections statewide.
Early 1994	Enforcement training for all inspectors conducted in response to 1994 EPA Region I report "Final Multi-media Overview Report on Massachusetts DEP Enforcement".
Summer 1994	Pilot test of FIRST CEI Protocol "B".
Oct 1994	FIRST CEI Protocol "B" finalized by joint BWP-EPA workgroup.
Nov 1994	Training conducted for all inspectors statewide in use of FIRST multimedia inspection protocol.
FY 1995	First year of two-year EPA Compliance Assurance Demonstration Grant: a two-year, consolidated compliance assurance demonstration grant to conduct multimedia inspections, increase flexibility in targeting facilities and industry sectors, and develop new measures of success. Multimedia inspections are conducted at nearly 100% of facility inspections: approximately 1100 multimedia inspections. First year of two-year initiative to inspect fuel dispensers for compliance with Stage II vapor recovery equipment requirements:

	a statistically meaningful number of randomly selected facilities is inspected.
Spring 1995	Boston Permit team and Compliance/Enforcement team develops first draft of BWP's "Measures of Success": an alternative approach to evaluating BWP's performance based solely on number of activities conducted (e.g., number of permits issued, number of inspections conducted).
Jul 1995	Measures of Success interim policy issued.
Aug 1995	BWP policy requiring cover letters with enforcement Notices of Noncompliance is finalized: cover letters contain education on source reduction/pollution prevention.
Fall 1995	"Test Group" task force, composed mainly of regional operations staff, reviews and revises Measures of Success interim guidance.
FY 1996	Second year of two-year EPA Compliance Assurance Demonstration Grant. Multimedia inspections are conducted at nearly 100% of facility inspections: approximately 1100 multimedia inspections. First year of two-year initiative to inspect print shops for compliance; a statistically meaningful number of randomly selected facilities are planned for inspections. Second year of two-year initiative to inspect Stage II fuel dispensers.
Jun 1996	BWP evaluation of Compliance Assurance Demonstration Grant begins.
Aug 1996	Interviews with inspectors from all regions are conducted to learn their experience with and use of the FIRST CEI Protocol.
Nov 1996	Compliance Assurance Demonstration Grant draft evaluation completed
April 1997	Compliance Assurance Demonstration Grant final evaluation report completed

APPENDICES

Waste Prevention FIRST

Facility-wide Inspections to Reduce the Source of Toxics

Protocol "B" Guidance

Compliance Evaluation Inspection Protocol

Facility-wide Inspections to Reduce the Source of Toxics (FIRST)

October 31, 1994

Massachusetts Department of Environmental Protection
Bureau of Waste Prevention

* FIRST COMPLIANCE EVALUATION INSPECTION PROTOCOL *

TABLE OF CONTENTS

* FIRST COMPLIANCE EVALUATION INSPECTION PROTOCOL *

PREFACE

This Preface provides some background and context for the FIRST Compliance Evaluation Inspection Protocol, and some working assumptions used during it's development.

I. TASK

In the Spring of 1993, the DEP/EPA Region I Waste Prevention FIRST Inspection Protocol Workgroup was tasked with developing a protocol for DEP inspections conducted according to the principles of FIRST (Facility-Wide Inspections to Reduce the Source of Toxics). A FIRST inspection should determine compliance with a facility's hazardous waste, air quality, industrial wastewater, solid waste, and Massachusetts Toxics Use Reduction Act requirements, and gather information which could be used to encourage the facility to practice source reduction.

In developing the inspection protocol, the workgroup was expected to evaluate the costs and benefits of DEP's current FIRST guidance (including current documentation requirements) and recommend any improvements to inspection effectiveness and efficiency. The workgroup was specifically directed by DEP's Assistant Commissioner for Waste Prevention to consider the value of conducting very in-depth inspections at a few facilities versus doing more cursory inspections at a greater number of facilities. The workgroup was expected to develop a protocol for one type of inspection. Furthermore, the resulting new protocol was to be developed without the constraints of current compliance inspection guidance. For more details see the final Scope of Work for the DEP/EPA Region I Waste Prevention FIRST Compliance and Enforcement Workgroups (November 1993).

In the course of the workgroup's efforts, a number of important issues emerged from the notion of an inspection hierarchy and substantively altering the content of a compliance inspection, including: 1) What should be the criteria for selecting the content of each inspection type, 2) What is lost by not evaluating certain aspects of compliance at the shorter, more focussed inspections (e.g. level playing field issues), 3) What is the appropriate mix of inspections, 4) How should facilities be targeted, 5) How would enforcement be conducted at each inspection type, and 6) How to account for the proposed inspection in the present EPA grant structure? The workgroup was not charged with, nor staffed to address these major issues. However, resolution of these issues is critical to successful implementation of the workgroup's proposal.

In order to forge ahead with the task, the workgroup had to make certain assumptions on these and other issues. Many of these assumptions are enclosed (or are implicit) in this document. Other assumptions can be found in the workgroup's earlier drafts and meeting summaries.

II. WORKING ASSUMPTIONS

The Workgroup recommended that the Bureau's compliance activity should include a mix of inspection types of varying detail and level of effort. The workgroup developed a general proposal for a hierarchy of three inspection types, with the content of each inspection type determined by the significance of risk posed by non-compliance. The Bureau of Waste Prevention will implement such a heirarchy, a general description of which follows:

Compliance Audit - The Compliance Audit inspection is a thorough evaluation of a every aspect of a facility's regulatory compliance, perhaps including an audit of compliance with record-keeping and self-reporting requirements.

Compliance Evaluation - The compliance evaluation inspection would be a more detailed evaluation of only those areas of non-compliance that are likely to result in a significant risk to public health and the environment. The compliance evaluation inspection, and the follow-up thereto, would also gather information which can be used to encourage facilities to practice source reduction -- particularly in order to correct violations. Compliance Evaluation inspections would take more time to complete than reconasiance inspections (see below), but significantly less than compliance audits.

Reconnaissance - The reconnaissance inspection would be a cursory scan for imminent threats, significant areas of non-compliance (including unregistered waste streams), and some obvious minor infractions. The reconnaissance inspection would be the quickest of the three proposed inspection types to complete.

What follows is the workgroup's recommendation for the content of a Compliance Evaluation Inspection (CEI). The workgroup elected not to build the Reconnaissance protocol since it could be developed relatively quickly by building off existing screening checklists. The workgroup did not develop the Audit protocol because it would be a more resource intensive undertaking than the CEI, and since the Audit would probably be the least frequently performed inspection type.

Note that one of the workgroup's greatest challenges was attempting to develop the compliance evaluation inspection protocol in the absence of consensus on the definition of significant risk, and without the context of the other two inspection types. The workgroup resolved this by relying heavily on the intuition of workgroup staff to select the inspection content.

III. DEP FINALIZATION OF THE PROTOCOL

After the workgroup presented its final recommendation for the FIRST CEI protocol, DEP staff, with input from EPA, made modifications to the content and format of the protocol. In some areas the content of the protocol has been expanded or modified considerably. Senior staff in DEP's Bureau of Waste Prevention agreed that these changes were essential to ensure adequate environmental protection. However, it is important to note that these expansions and modifications have, in many areas, brought the protocol guidance to nearly the level of detail of the status quo programmatic inspection guidance (e.g. Air-Level II, RCRA Compliance Evaluation Inspection, and NPDES full inspection). Therefore, the protocol is no longer strictly limited to issues posing significant risk as defined by the original DEP/EPA workgroup.

IV. ELEMENTS OF THE PROTOCOL

This protocol consists of two elements: guidance on how to conduct the compliance evaluation inspection (including a detailed explanation of the inspection elements), and the minimum inspection documentation required by DEP and EPA, beyond DEP's current reporting mechanisms (RCRIS, PCS, SSEIS, and FMF). The documentation can also serve as the primary inspection field tool, at the discretion of the user.

* FIRST COMPLIANCE EVALUATION INSPECTION PROTOCOL *

INTRODUCTION

Intent/Applicability

The intent of a FIRST Compliance Evaluation Inspection is to determine compliance with the Department's air quality, hazardous waste, industrial wastewater, and Toxics Use Reduction Act regulations, with a focus on abating violations causing current or likely future significant risks. This inspection is formatted as a facility-wide, process-based analysis which supports comprehensive evaluation of compliance as well as identification of significant pollution prevention opportunities.

This protocol is intended to be a guidance or reference document outlining the procedure and minimum elements (e.g. what items to look at and what compliance determinations to make) of a Compliance Evaluation Inspection. This protocol is not a checklist to be filled out during the course of the inspection. Field staff should not be expected to implement this protocol without proper training -- the protocol itself is not a stand-alone training tool.

This protocol is designed for use at the majority of facility-types inspected by DEP's Bureau of Waste Prevention (BWP). Specifically, this applies to manufacturing and commercial facilities. It does not apply to waste management facilities (such as TSDs, solid waste incinerators, etc.), utilities, fuel dispensers, bulk fuel storage facilities, and others. The protocol should be used for all classes of hazardous waste generators, all categories of air sources, all types of industrial wastewater dischargers, all potential and current Toxic Use Reduction Act filers, and any combination thereof. This is a process-based compliance inspection and does not address certain areas of compliance not related to the process (e.g. asbestos, cross-connections, storm water).

On-Site Inspection Procedure

Once on site, the field staff will gather information, and make compliance determinations according to the attached FIRST Compliance Evaluation Inspection Outline and subsequent Inspection Guidance. Gather the appropriate information by: 1) asking questions, and 2) making observations while conducting these activities in the following order:

1. Pre-inspection Interview,

2. Process Area Tour (including observations made at each process area in the facility, as well as observations made outside the facility before, during, and/or after the interior inspection),

3. Waste Management Area Tour (including hazardous waste accumulation areas and waste water treatment areas),

4. Review of Records, and

5. Post-Inspection Interview.

The field staff should gather as much information as possible during the pre-inspection interview, and then use subsequent activities to verify/challenge information obtained during the interview, and to observe activities not discussed in the interview. The information initially gathered during the pre-inspection interview will include some elements from the process, waste management, and record review portions of the inspection guidance.

* FIRST COMPLIANCE EVALUATION INSPECTION PROTOCOL *

PROCEDURAL OUTLINE

I. Pre-inspection Activity: Conduct pre-inspection activities as outlined in DEP/BWP Final Policy 94-3, "Pre/Post Inspection Reporting Guidance." This includes generating the FMF Pre-Inspection Report, which is a useful field tool and should be attached to the inspection report submitted to the file.

* Note: During pre-inspection file review, check DEP records (hard files and relevant databases) dating back for FIVE years for a history of non-compliance in all BWP programs. A pattern of non-compliance may affect any enforcement action resulting from this inspection.

II. On-Site Inspection Activity:

A. Missing Information: Obtain any key missing information from the pre-inspection file review materials (including the FMF Pre-Inspection Report), including SIC Code for all sources and UTM coordinates for air sources.

* Note: If feasible, try to get a map or diagram of the plant before the start of the inspection. This will enable you to know where you are and to keep more accurate notes along the way. Before starting the inspection, ask the person accompanying you where in the plant you are going to visit and which areas he/she will NOT be showing you. As you inspect, check out a few of the areas that WEREN'T on the scheduled itinerary. This could include floors, sheds, under stairs, under plates in floors, out-of-order rest rooms, dumpsters, and roofs.

B. Products Produced by Facility: Identify/verify the products/services produced by the facility, in general.

C. General Facility Evaluation: Conduct a general, non-process facility evaluation for Storage Areas/O&M, Air, and Hazardous/Solid Waste, and note any violations.

D. Unit Operation/Process Evaluation: For each unit operation or major process step, use the guidance below and note any violations.

1. Obtain/Verify the Operation/Process Description (If feasible, obtain and review/verify a current

process flow diagram or your notes from any verbal description of the process obtained in the pre-inspection interview.)

2. Obtain/Verify Condition of Operation of the process. Include Housekeeping.

3. Obtain/Verify Input Substances and Approximate Quantities, e.g. for AQ and TURA threshold determinations, if needed.

4. Outputs/Waste Streams:

   a. Air Waste Stream:

      1. Obtain/Verify the general nature of the waste stream (what is it, why is it generated?).

      2. Follow All Appropriate AQ-Process Inspection Guidance and note any violations:

         APPROVED (PERMITTED) PROCESSES:
         * #3 for all Approved Processes

         UN-APPROVED PROCESSES:
         * #4 for Un-Approved Coating and Printing Operations
         * #5 for Un-Approved Degreasers
         * #6 for Un-Approved Combustion Activity
         * #7 for Un-Approved Plating Operations
         * #8 for Un-Approved General Processes
         * #9 for Un-Approved Processes with a Fabric Filter Control Device
         * #10 for Un-Approved Processes with a Wet Scrubber Control Device

      3. Take note if this is an un-approved process with an afterburner, electrostatic precipitator, carbon adsorber, or other control device not listed in B(2). Refer to Unapproved Sources Cover Sheet.

   b. Water Waste Stream:

      1. Obtain/Verify the general nature of the

waste stream (what is it, why is it generated?).

2. Follow Inspection Guidance #12 and note any violations.

c. Solid Waste Stream:

1. Obtain/Verify the general nature of the waste stream (what is it, why is it generated?).

d. Hazardous Waste Stream:

1. Obtain/Verify the general nature of the waste stream (what is it, why is it generated?).
2. Follow Inspection Guidance #16 and note any violations.

5. Identify any media transfer of waste streams after generation, particularly resulting from pollution control/management techniques. For example, scrubber water discharge, or routine/excessive use of speedy-dry to collect waste oil. Evaluate all such media transfer for compliance in accordance with each media (items 4a thru 4d above).

6. Identify Potential Pollution Prevention Opportunities (Follow Inspection Guidance #20.

E. Industrial Wastewater Treatment: For the industrial wastewater treatment operation, obtain/verify the information outlined on Inspection Guidance #13 and note any violations. Also note any media transfers and evaluate all such media transfer for compliance in accordance with each media (items 4a, 4b, and 4c above).

F. Hazardous Waste Accumulation Evaluation: For each hazardous waste accumulation area, obtain/verify the information outlined on Inspection Guidance #17 and note any violations.

G. Record Review: Conduct a record review and obtain/verify the information outlined in the appropriate inspection guidance forms: (Air #11, Water #14, Hazardous #18, and TURA #19), and note any violations.

H. Communication of Inspection Results: Communicate to the facility the results of the inspection, including

all obvious violations observed, general follow-up procedures (such as how results of the inspection will be used and what further communications DEP may have with the facility), any questions that remain to be asked of the facility, and potential pollution prevention opportunities. Note that all findings are preliminary until reviewed by the field staff's supervisor.

I. Violation Observations: During the course of the inspection, it is critical for the field staff to note whether one or more violations are: A) willful and not the result of error, B) result in significant impact on health, safety, welfare, or on the environment, C) a failure to promptly report unauthorized disposal or a release of hazardous waste or material (as per 21C or 21E), or D) part of a pattern of non-compliance.

III. Post-Inspection Activity: Complete the FIRST Compliance Evaluation Inspection Form or FIRST CEI Memo. These can be hand-written or typed, unless otherwise stated by regional management. For guidance on content, see Example of Completed FIRST Compliance Evaluation Inspection Form and Memo. Conduct subsequent enforcement if appropriate. Conduct other post-inspection activities, including all regular reporting to EPA and DEP (e.g. FMF, SSEIS, RCRIS, PCS) as outlined in DEP/BWP Policy 94-3, "Pre/Post Inspection Reporting Guidance." This should include placing the completed FIRST CEI Inspection Form or Inspection Memo, along with any associated notes and the FMF pre- and post inspection reports, into the appropriate DEP file. Note that the FIRST CEI Form or Memo, along with any enforcement documentation, replaces all other inspection memos, trip reports, and inspection checklists.

INSPECTION GUIDANCE #1
GENERAL FACILITY EVALUATION
NOT MEDIA SPECIFIC

RAW MATERIAL STORAGE AREA

1. Is there evidence of a current or likely significant threat posed in the raw material storage area(s)? (e.g signs of spills or leaks -- particularly near floor drains or other routes of emission.) Also look for storage of VOCs in open container.

FACILITY-WIDE O&M/HOUSE-KEEPING

1. Take note of operation & maintenance and house-keeping throughout the facility, including process and waste-management areas. Watch for sloppy housekeeping and poor O&M that could result in violations of applicable regulations or significant environmental threats (refer to subsequent inspection guidance documents). Also note that poor housekeeping/O&M are often excellent source reduction opportunities.

   Examples of house-keeping/O&M areas to watch for:

   - Malfunctioning pollution control/treatment equipment (e.g. leaking pumps in the wastewater treatment facility which are likely to impair treatment effectiveness).
   - Evidence of spills and mis-management of spills, and other mis-handling of materials.
   - Cleanup procedures which result violations and/or preventable pollution (e.g. how are cleanup rags managed and spent solvents managed).

INSPECTION GUIDANCE #2
AIR QUALITY: GENERAL EVALUATION
(NON-PROCESS)

1. Visible Emissions: Describe the type and durations of any visible emissions from any process:

Color (black, white, blue, etc)

Opacity (0%, 10%, 20%, 30%, > 40%)

Duration (minutes)

EVALUATION CRITERIA: Visible emission (opacity) regulations generically prohibit opacity greater than what is reasonable, but in no case in excess of; 20 % opacity for incinerators; 0% for spark ignited internal combustion and diesel engines; 20% for more than 2 minutes per hour never to exceed 40 % for other sources. Sources with written approvals may have lower opacity limits. Water or water vapor is not considered in any opacity evaluation.

Any observed opacity should be noted for color, intensity, and duration. Enforcement of visible emission limits requires the inspector to be certified by EPA for reading opacity and requires documentation according to EPA Method 9.

2. Odor/Noise: Describe, in general, any detectable odors and/or noise at the facility site and off-site:

EVALUATION CRITERIA: Both these items should be noted for general purposes such as indication of control equipment functioning, use of volatile materials, etc. Actual noise quantification requires a calibrated noise meter and odor is a subjective determination. A quantification of noise or odor for compliance purposes is not part of this inspection.

INSPECTION GUIDANCE #2
AIR QUALITY: GENERAL (NON-PROCESS) EVALUATION

3. Air Quality Control Equipment Condition:

Is there particulate build up on stacks and surrounding area?

Is equipment rusting, leaking or structurally unstable?

EVALUATION CRITERIA: Any process or equipment not in good condition which could affect the emission or control of air pollution should be cited or receive an approval evaluation.

AIR QUALITY: PROCESS SOURCES COVER SHEET

There are five criteria against which any source (approved or unapproved) may need to be evaluated. This criteria, along with that listed in the individual sections will comprise the inspection:

1. **Need for approval as a new source (310 CMR 7.02).** This is necessary if the process is not exempted from approvals as too small under 7.02(2)(2)(a). A copy of this section is attached.

   Note that there is a limited grand-fathering provision that should be discussed with Regional staff familiar with air regulations. Most commonly, this is for sources constructed before 1972 and not modified since, or only modified in accordance with exemptions in 310 CMR 7.02(2)(2)a or 7.03.

2. **Is it a specific process which is potentially affected by VOC RACT rules (310 CMR 7.18)?** In other words, does the process fit the description (process type and emission threshold) of one listed in the Appendix I. This Appendix is a summary of 7.18 categories.

3. **Is it a process which is potentially affected by the generic VOC RACT rule (310 CMR 7.18(17))?** In other words, is the process a potential 50 ton per year VOC source, not listed in Appendix I. In such case there are specific requirements as well as a plan approval requirement. If only actual emissions are known, not potential emissions, use a threshold of 25 tons per year actual VOC emissions.

4. **Is the approval for combustion units which are potentially affected by NOx RACT rules (310 CMR 7.19)?** In other words, is total facility, not just individual units, a 50 TPY NOx source [approximately equivalent to 115,000,000 BTU/HR facility using Natural Gas, 80,000,000 BTU/Hr using distillate fuel (#2), 30,000,000 BTU/Hr using residual fuel (#4 or 6)].

5. **Is the process/unit possibly exempt from the written approval requirements through a categorical exemption (310 CMR 7.03)?** In other words, does the process meet all the requirements listed in 7.03. Note that categorical exemptions exist only for a some types of sources and some of the requirements are quite complex (coating formulations, etc) and may not be able to be demonstrated during the inspection. However, it is a requirement that such demonstration be available on-site and readily accessible. Inspector discretion is needed in such cases. A copy of 7.03 is attached.

INSPECTION GUIDANCE #3
AIR QUALITY: PROCESS - APPROVED SOURCES

General Conditions

A written approval will specify equipment approved, operating parameters, control equipment, etc. To be in compliance with the approval, the process must be in compliance with these conditions. Below are general conditions of an approval which should be evaluated:

1. Process equipment manufacturer and model

2. Throughput limitations
   Raw material type, amount, formulation-VOC limit, fuels, etc.

3. Control equipment manufacturer and model

EVALUATION CRITERIA:

If these general conditions are the same at the time of inspection as that required in the written approval then no further action is necessary for that process.

Evaluate any changes observed for:

1. Violation of a condition in the approval

2. Need for a new approval, i.e. are the changes exempted under 7.02(2)(2)(a)?. Note that for previously approved sources, there are few exemptions because most any change would contradict the approval.

If discrepancies are found, a comprehensive inspection (e.g. compliance audit) of the process should be conducted and/or enforcement actions initiated.

INSPECTION GUIDANCE #3
AIR QUALITY: PROCESS - APPROVED SOURCES

Approval Validity

With the continuing development of new standards, some older approvals may be invalidated. The following items should be checked.

The general conditions listed above should still be evaluated in any case.

1. Is it a specific process which is potentially affected by VOC RACT rules (310 CMR 7.18), and was the approval issued before the date listed for that process?

2. Is it a process which is potentially affected by the **generic** VOC RACT rule (310 CMR 7.18(17)), and was the approval issued before January 1, 1990?

3. Are the combustion units potentially affected by NOx RACT rules (310 CMR 7.19), and was the approval issued before September 1993?

If the answer to any question is yes, an in-depth analysis of the approval is necessary and the Regional procedure for such an analysis should be used (direct referral to permit group, consultation with knowledgeable staff, etc).

AIR QUALITY: PROCESS - UN-APPROVED SOURCES COVER SHEET

According to the type of process, refer to one of the following:

- ☐ Unapproved Coating and Printing
- ☐ Unapproved Degreasers (Cold, Vapor, Conveyorized)
- ☐ Unapproved Boilers/Combustion
- ☐ Unapproved Plating
- ☐ Unapproved General Process

Any incinerator should have a written approval and be evaluated for compliance with the approval. If an incinerator is found without an approval, it is a violation.

* NOTE: The above referenced guidance documents may call for information from the source which may not be readily available at the time of inspection. In many cases, requesting that the facility fill out and submit a DEP "Source Registration Form" is the best means for gathering such information.

For unapproved process with control equipment, refer to one of the following:

- ☐ Unapproved fabric filter
- ☐ Unapproved wet scrubber

If one of the following control devices is present, an approval is likely necessary and the source should be evaluated for the need for an approval:

- ☐ afterburner
- ☐ carbon adsorber
- ☐ electrostatic precipitator
- ☐ other .

Note that an "Approval Evaluation" is often called for in the Evaluation Criteria for the unapproved process/equipment inspection guidance that follows. These approval evaluations can entail detailed engineering evaluations and applicability determinations, and may not be appropriate as a field activity to be conducted by the FIRST field staff.

INSPECTION GUIDANCE #4
AIR QUALITY: PROCESS - UNAPPROVED COATING AND PRINTING

Define the source. The type of operation and the daily, monthly or annual emissions determine the standards/emission limits with which the process must comply or the need for approvals.

1. Does the process fit the description of one listed in the Appendix I.

2. Daily amount of coating or other compounds containing organics used (maximum gallons used/day)

3. Yearly amount of coating or other compounds containing organics used (gallons used in previous year)

4. Yearly amount of other compounds used (gallons used in previous year)

5. Type of spray guns used, if any, such as HVLP, electrostatic, airless, etc.

6. Spray filters used (yes/no) and condition.

EVALUATION CRITERIA: Estimate daily, monthly and yearly pounds of all organic compounds emissions. If necessary, multiply organic compounds formulation usages (gallons) by 7.5 (a rule-of-thumb is that organic compounds formulations contain 7.5 lbs/gal) and assume all the organic compounds used are emitted to the air. Other assumptions such as non-volatilized VOC and recovered VOC amounts can be made at the inspector's discretion, but must be verifiable.

Evaluate the unapproved process for:

1. Need for approval as a new source (310 CMR 7.02).

2. Is it a specific process which is potentially affected by VOC RACT rules (310 CMR 7.18)?

3. Is it a process which is potentially affected by the **generic** VOC RACT rule (310 CMR 7.18(17))?

4. Is the process/unit possibly exempt from the written approval requirements of items above through a categorical exemption (310 CMR 7.03)?

Process subject above and not eligible for the exemption described should be referred for the proper approvals (i.e. a NON). It is not necessary to reconcile multiple approval requirements.

INSPECTION GUIDANCE #5
AIR QUALITY: PROCESS - UNAPPROVED DEGREASERS

Solvent Data (All Degreaser Types)

Gather/verify the following information for each degreasing unit, regardless of type.

1. Name of solvent used.

2. What percentage of the solvent is an organic (other than water).

3. Monthly usage (gallons).

4. Annual usage (gallons).

EVALUATION CRITERIA: Any degreaser should meet the standards listed in the subsequent sections.

Additionally, evaluate each unit for:

1. Need for approval as a new source (310 CMR 7.02).

2. Is the process/unit possibly exempt from the written approval requirements above through a categorical exemption (310 CMR 7.03)?

   For degreasers, this is possible for any individual degreaser that uses less than 100 gallons per month of solvent (this does not include any amount sent out for disposal or recycling) and meets all the requirements listed in this guidance for degreasers (i.e. freeboard, covers, etc).

Degreasers subject above and not eligible for the exemption described should be referred for the proper approval (i.e. a NON). Additionally, any degreaser not meeting the requirements listed in this guidance for degreasers (i.e. freeboard, covers, etc) should be targeted for enforcement.

Note: all degreasers are subject to VOC RACT (310 CMR 7.18) but those requirements are the guidance for degreasers (i.e. freeboard, covers, etc) listed herein.

Generic (All Degreaser Types)
1. Storage of solvents in closed containers.
2. No leaks.
3. Provisions for draining cleaned parts before removing from degreasers (drying tunnels, racking of parts; .etc).
5. Units covered when not in use.

INSPECTION GUIDANCE #5
AIR QUALITY: PROCESS - UNAPPROVED DEGREASERS

Vapor Degreasers

Solvent is heated to produce vapors. Cleaning is accomplished by submersion of parts in the vapor zone (and sometimes into fluid).

1. Easily operated cover which does not disturb vapor zone
2. The following safety switches:
   a. sump shut off for condensor failure
   b. spray pump shut off if vapor level falls 4" below coils
3. One of the following:
   a. freeboard ratio of at least 0.75 *
      (if degreaser opening is greater than 10 sq ft then the unit also needs a power cover).
   or
   b. refrigerated chiller
   or
   c. enclosed design
   or
   d. an adsorption system
   or
   e. approved alternative device
4. no porous or absorbent materials used
5. less than 1/2 open top area occupied by each work load
6. cover located below lip exhaust, if present.

* freeboard ratio:

a. distance from the top of the liquid level to the lip of the tank (inches)

b. smaller interior dimension of length, width or diameter (inches)

c. freeboard ratio (a/b)

INSPECTION GUIDANCE #5
AIR QUALITY: PROCESS - UNAPPROVED DEGREASERS

Cold Cleaners

Solvent is unheated or not heated to boiling point. Cleaning is accomplished by submersion of parts in the fluid. Most of these units encountered will be unheated small parts cleaners (such as safety-kleen, etc) and require no evaluation beyond the Generic requirements.

Conveyorized Degreasers

Description: Continuous process of cleaning parts. Heated or unheated solvent used.

1. One of the following if the air/vapor interface is > 21.5 sq ft:
   a. refrigerated chiller
   or
   b. an adsorption system
   or
   c. approved alternative device

2. The following safety switches:
   a. sump shut off for condensor failure
   b. spray pump shut off if vapor level falls 4" below coils

I. Define the source. The type of combustion source and the size (BTU/HR) are factors that determine the standards and/or emission limits with which the process must comply (see categories in Appendix I) or the need for approvals.

1. Type of combustion unit (boiler, internal combustion engine, turbine, space heater, oven, etc)

2. Manufacturer

3. Rating (MMBTU/hr heat input, gallons/hr of fuel, etc)

4. Type of fuel(s) used (oil, natural gas, coal, wood, etc)

5. Grade of fuel used (#2, 4, 6 oil, etc)

6. Sulfur content of fuel (% by weight)

7. Does the unit burn waste oil

8. For boilers, is opacity monitor present on units > 40,000,000 BTU/hr that burn oil or solid fuel?
   a. Are meters operational?
   b. Is there an audible alarm?

EVALUATION CRITERIA: Evaluate the unapproved process for:

1. Need for approval as a new source (310 CMR 7.02).

2. Are the combustion units potentially affected by NOx RACT rules (310 CMR 7.19)?

3. Is the process/unit possibly exempt from the written approval requirements through a categorical exemption (310 CMR 7.03)?

   Currently the only combustion exemption is an emergency standby engine less than 10,000,000 BTU per hour and has an exhaust silencer (muffler) and a stack discharge which will not impact the environment (note: an emergency engine cannot be used for load sharing, peak shaving or any other circumstances. It can only be used when power is disrupted to the facility and only for as long as the outage remains)

Process subject above and not eligible for the exemption described should be referred for the proper approvals (i.e. a NON). It is not necessary to reconcile multiple approval requirements.

Note that for any combustion source:

Residual fuel is prohibited in any facility < 3,000,000 BTU/Hr.

Residual fuel > 0.5 % sulfur content is prohibited in Arlington, Belmont, Boston, Brookline, Cambridge, Chelsea, Everett, Malden, Medford, Newton, Somerville, Waltham and Watertown without written approval.

Any facility utilizing waste oil as a fuel in any unit other than a space heater must have written approval.

INSPECTION GUIDANCE #7
AIR QUALITY: PROCESS - UNAPPROVED PLATING EVALUATION

1.	Type of plating operations [bright dip - electroless - anodizing - acid/alkaline - etc]
2.	Identify heated baths and baths with exhaust ventilation
3.	Compounds used in plating tanks
4.	Chemical make-up of compounds
5.	Amount of chemicals used (gallons per year)
6.	Are any organic compounds or organic compound containing materials used
7.	Amount of organic compounds containing material used (gallons/year)
8.	Is a scrubber used to control emissions

EVALUATION CRITERIA:

For process that use organic compounds, estimate emissions from the source on a yearly basis. To obtain pounds of organic compounds emitted multiply organic compounds usages (gallons) by 7.5 (a rule-of-thumb organic compounds content for organic compounds formulations is 7.5 lbs/gal) and, if appropriate, assume all the organic compounds used are emitted to the air.

Evaluate the unapproved process for:

1. Need for approval as a new source (310 CMR 7.02).

   As a further guide to whether a plating source needs a new source approval, if the operation;

   a. has organic compounds emissions greater than one (1) ton per year, it should receive an approval evaluation;

   b. has baths that are equipped with an exhaust ventilation system and the process does not have a scrubber, it should receive an approval evaluation.

2. Is it a process which is potentially affected by the **generic** VOC RACT rule (310 CMR 7.18(17))?

Note: there are no written approval exemptions (7.03) for plating operations.

Process subject above and not eligible for the exemption described should be referred for the proper approvals (i.e. a NON). It is not necessary to reconcile multiple approval requirements.

INSPECTION GUIDANCE #8
AIR QUALITY: PROCESS - UNAPPROVED GENERAL PROCESS

1. Description of process

2. Type of equipment used

3. Raw materials used description (chemical name, not trade names where possible)

4. Organic compounds content, if any, of raw materials (lbs/gal)

5. Hourly raw materials usage rate (indicate units: lbs/hr, gal/hr, etc)

6. Yearly raw materials usage rate (indicate units: lbs/yr, gal/yr, etc)

7. Finished product(s) description

8. Emissions
   pollutant name
   tons/yr

EVALUATION CRITERIA: From the information obtained estimate emissions from the source on a monthly and yearly basis. For process that use organic compounds, to obtain pounds of organic compounds emitted multiply organic compounds usages (gallons) by 7.5 (a rule-of-thumb organic compounds content for organic compounds formulations is 7.5 lbs/gal) and, if appropriate, assume all the organic compounds used are emitted to the air. For other processes, an evaluation of emissions needs to be conducted based on available information.

Evaluate the unapproved process for:

1. Need for approval as a new source (310 CMR 7.02).

2a. Is the approval for a specific process which is potentially affected by VOC RACT rules (310 CMR 7.18)?

2b. Is it a process which is potentially affected by the **generic** VOC RACT rule (310 CMR 7.18(17))?

3. Is the process possibly exempt from the written approval requirements through a categorical exemption (310 CMR 7.03)?

Process subject above and not eligible for the exemption described should be referred for the proper approvals (i.e. a NON). It is not necessary to reconcile multiple approval requirements.

INSPECTION GUIDANCE #9
AIR QUALITY: PROCESS - UNAPPROVED FABRIC FILTER

For any process without an approval that has a fabric filter (baghouse):

1. Is there a pressure drop indicated of at least one inch water gauge?

2. Is equipment generally in good condition.

3. Is disposal of collected particulate managed so as not to expose the material.

4. Is unit exhausted internally (inside the building) or through an external stack (to the ambient air)?

EVALUATION CRITERIA: Without knowledge of design parameters for the filter it is difficult to evaluate proper performance. Design parameters can vary widely depending upon the pollutant being controlled. In general results different than above merit further investigation.

INSPECTION GUIDANCE #10
AIR QUALITY: PROCESS - UNAPPROVED WET SCRUBBER

For any process without an approval that has a wet scrubber:

1. Is there water circulating through the unit and does it appear to cover all packing in the unit.

2. Is there a pressure drop indicated of at least one inch water gauge?

3. If scrubber water is recirculated and acids or alkalines are in the air stream, is there a pH control.

4. If scrubber water IS NOT recirculated, is it this resulting water waste stream regulated appropriately?

EVALUATION CRITERIA: Without knowledge of design parameters for the scrubber it is difficult to evaluate proper performance. Design parameters can vary widely depending upon the pollutant being controlled. In general results different than above merit further investigation.

INSPECTION GUIDANCE #11
AIR QUALITY: RECORD REVIEW

1. Is the total facility potentially affected by the generic VOC RACT rule (310 CMR 7.18(17))?

   This is to be evaluated using total of all emissions for all processes at the facility.

2. If the facility did not file a Source Registration, is the source applicable to Registration/Inventory filing (above thresholds in 310 CMR 7.12)?

INSPECTION GUIDANCE #12
PROCESS WASTE WATER STREAM EVALUATION

(1) Is water used in any process (including boiler blow down, cooling water, washdown, etc.)?

(a) If yes, where is the water used in the process?

(2) Does the facility discharge waste water?
sanitary __ cooling water __ process water __
boiler/cooling blowdown __ Other ___

(a) Where do the discharge(s) go? (e.g., surface water, sewer system, subsurface system, ground, holding tank for transport off-site, etc.)

(3) Locate all discharge points at the facility (e.g. floor drains, sump pumps, blowdowns, cooling water, sanitary waste, process waste water, etc.)

(a) Are all discharges covered by a permit?
(1) Discharge to surface waters
(2) Discharge to sewer
(3) Discharge to ground/subsurface system
(4) Discharge to holding tank

(b) If the discharge is permitted:
(1) Has the discharge changed since the permit was issued (e.g. have there been process changes/additions that has resulted in changes to the characteristics or volume of the discharge since permit issuance?) If yes, refer to DEP Permitting staff for possible permit modification.
(2) Has the discharge permit expired? Has the facility applied for a new permit?

(c) If the discharge (surface water,sewer, ground) is not permitted by DEP or EPA describe:

(1) the source/type of the wastewater generated.

(2) the approximate quantity of the wastewater discharged.

(3) any observable impact of the discharge on the environment (e.g, oil sheens, grease or scum layers, foam, floatables, color, odors, turbidity, fish kills, etc.).

(4) describe any wastewater treatment performed at facility (including precipitation or pH adjustment).

Using existing guidance regarding permit applicability, make a determination of the need for a permit (e.g. determine what if any exemptions apply) and conduct enforcement as appropriate. Refer to EPA and DEP Permitting (MWRA when applicable) for further follow up if needed.

INSPECTION GUIDANCE #13
INDUSTRIAL WASTEWATER TREATMENT FACILITY EVALUATION
(FOR PERMITTED DISCHARGES ONLY)

(1) Have there been any changes in treatment performed at the facility? If yes, refer to permit staff for possible permit modification.

(2) Does the facility monitor its discharge as required by its permit?

Specifically, this should include whether the sampling location is appropriate for obtaining a representative sample, as called for by the permit. For example:

(a) Sample before entering receiving stream.

(b) Sample before mixing with other waste streams.

(Note: If the facility is subject to a National Categorical Pretreatment Standard, self-monitoring and reporting must be performed at least semi-annually.)

(3) Treatment Facility Effectiveness

(a) Is there evidence of current or past upsets, bypasses, overflows, clogging, or erosion?

(b) Does the effluent have odor, color, turbidity?

(4) Treatment Facility Staffing

Describe staffing at the treatment facility including the number of operators and laboratory personnel and their certifications. (Check current staff levels against staffing plan.)

(1) Is certified operator on-duty at all times facility is discharging?

(2) Is operator certified at the proper grade for the facility, as specified in the permit?

(5) Treatment Sludge Management

Is there a sludge generated from the wastewater treatment? If yes, is it hazardous? (the facility is required to make this determination). Is the sludge being managed properly?

INSPECTION GUIDANCE #14
INDUSTRIAL WASTEWATER: RECORD REVIEW
(FOR PERMITTED DISCHARGES ONLY)

(1) Are there flow or concentration violations? Compare permitted values against actual reporting results. Describe all violations that are found.

(Note: If the facility is subject to a National Categorical Pretreatment Standard, the discharge must be in compliance with applicable pretreatment standards.)

(2) Does the facility report its discharge as required by the permit? (For example, pH should not be averaged but should be reported as a maximum - minimum range.)

INSPECTION GUIDANCE #15
SOLID WASTE EVALUATION

1. Is there any evidence of on-site burial or of questionable storage practices of solid waste or other wastes? (Use your judgement for what might be a questionable solid waste storage practice, e.g. large piles of industrial solid waste being stored outside.)

   EVALUATION CRITERIA: Burial and storage of solid waste without a Determination of Need and/or Site Assignment may be illegal per 310 CMR 16 and 19.

2. Check the dumpster or other solid waste disposal staging area for evidence of waste being disposed of as "solid waste" that should be more stringently regulated.

   Specifically, watch for hazardous wastes, industrial sludges, asbestos, infectous wastes, or any other industrial waste that in your judgement seems like it could have an adverse impact on the environment if managed/disposed of as solid waste.

   EVALUATION CRITERIA: Hazardous wastes either listed 310 CMR 30.___ or characteristic 310 CMR 30.___ and substances that are hazardous wastes by the mixture rule 310 CMR 30.___ must be managed and disposed of in compliance with 310 CMR 30. The burden is on the facility to test and characterize wastes as hazardous.In addition, liquid wastes - frequently containerized i.e. spent baths, that are not permitted for disposal under an Industrial Waste Water permit and are not being manifested as hazardous waste should be characterized and scrutinized during an inspection as to their disposal and potential for adverse impact on the environment if managed/disposed of as solid waste legally or illegally. Note that the on-site management of non-hazardous industrial sludges, asbestos, and infectous wastes are all regulated by other DEP or DPH programs, and any questionable management practices (e.g. in the dumpster) warrant some follow up with the appropriate program expert.

USE THIS PAGE FOR VERY SMALL QUANTITY GENERATOR ONLY

STATUS DETERMINATION

A Very Small Quantity Generator (VSQG) generates less that 100 Kgs of hazardous waste or waste oil per month. (100 Kg is approximately 25 gallons or 1/2 barrel.)

Review as many records and observe amount on site as needed to make this determination.

IF SQG OF <u>WASTE OIL</u>: USE SQG GUIDANCE

HW: PROCESS (VSQG)

HAZARDOUS WASTE ACCUMULATION

Does the generator accumulate hazardous waste on-site in tanks or containers?

If yes,
Are containers in good condition?
Are containers closed when not in use?
Are containers properly labelled (with the words "hazardous waste", the type of waste, the hazard associated with the waste)?

Does the facility generate any "P" wastes (acutely hazardous) which are not allowed under VSQG status?

HW: RECYCLING ACTIVITIES (VSQG)

Does the facility recycle, reclaim or reuse any wastes on-site?

Describe:

HW: RECORD REVIEW (VSQG)

Are all off-site shipments of hazardous waste documented? (All documentation should be reviewed.)

SMALL AND LARGE QUANTITY GENERATOR QUESTIONS

STATUS DETERMINATION

A Large Quantity Generator (LQG) generates 1000 kgs of hazardous waste or more per month. The waste must be shipped in 90 days. There is no limit to the amount which can be accumulated.

A Small Quantity Generator (SQG) generates between 100 and 999 kg of hazardous waste per month. The waste must be shipped in 180 days and is limited to 6000 kg in tanks and 2000 kg in above ground containers.

(100 kg ------- approx. 25 - 27 gallons)

Review as many manifests as needed to make this determination.

This document can be used for both SQG and LQG inspections. If the company is a LQG, address all questions. If the company is a SQG address all questions except those followed by "LQG ONLY."

IMPORTANT NOTE FOR PERSONNEL TRAINING AND CONTINGENCY/EMERGENCY PLANNING REQUIREMENTS: A detailed review of completeness (as outlined in DEP's existing hazardous waste generator inspection guidance) should be performed the first time a facility is inspected and at least every fifth year thereafter.

IMPORTANT NOTE FOR MANIFEST REQUIREMENTS, EXPORTING REQUIREMENTS, AND LAND DISPOSAL RESTRICTIONS: During a Compliance Evaluation inspection, only conduct a detailed evaluation of documentation completeness and accuracy if warranted. (For guidance on conducting a detailed evaluation of these items, see existing inspection guidance for hazardous waste generators, land disposal restrictions, and exporting requirements.)

(1) Has the facility instituted the use of proper emergency equipment and information?

- internal communications or alarm system
- telephone or two-way radio to call emergency response personnel
- fire extinguishers, fire control equipment, spill control equipment and decontamination equipment
- markings identifying all exits
- up-to-date lists posted near every phone at generation sites containing: names and number of emergency coordinators; locations of fire extinguisher, control materials and alarms; telephone number of fire department; and evacuation routes.

(2) Does the facility handle ignitable, reactive or incompatible (see incompatible attachment) waste?

If yes, are the above wastes properly handled and segregated?

Properly Segregated (ignitable or reactive):

Separated from sources of ignition or reaction, such as;

- open flames, smoking, cutting and welding, hot surfaces, frictional heat, static electricity, spontaneous ignition, radiant heat

Properly handled:
While handling, shall confine smoking and open flames. "No Smoking" signs shall be posted where there is potential for a possible hazard.

Properly Segregated (incompatible):

Separated from incompatible by means of a dike, berm, wall or other device?

(1) Does the generator accumulate hazardous waste at or near a generation point (satellite accumulation)? If yes,

A) Are containers in good condition (no severe rusting, structural defects or leaks)?
B) Are containers closed when not in use?
C) Are containers properly labelled with the words "hazardous waste," the type of waste, and the hazard associated with the waste?

(2) Does the generator accumulate other hazardous waste on-site in tanks or containers? If yes,

A) Are containers in good condition?
B) Are containers closed when not in use?
C) Are containers properly labelled with the words "hazardous waste," the type of waste, and the hazard associated with the waste, and must also include the accumulation start date)?

If stored outside:

D) Is area sufficiently impervious to contain leaks, spills and precipitation until the material is detected and removed (generally, there should be no; wood or dirt floors, cracks, gaps, seems, or floor drains)?
E) Is there sufficient secondary containment (10% of total volume of waste contained in the area, or 110% of the volume of the largest container, whichever is greater?)
F) Is unauthorized entry prevented (By means of a fence, locked area, or 24 hour guard to; prevent unknowing entry of persons, reduce the potential of unauthorized entry of persons and to prevent the entry of livestock)?

If no liquid waste in the hazardous waste accumulation container:

G) Is area sloped or designed for drainage? OR Are containers or tanks protected from contact with accumulated liquid (such as rain water)?

HAZARDOUS WASTE ACCUMULATION (CONT.)

(3) Is there sufficient aisle space between containers if hazardous waste to allow for the unobstructed movement of personnel and emergency equipment (to inspect or allow for spill or fire control)?

(4) Does the generator have underground accumulation tanks?

Is the tank made of non-corrosive material?

Has the facility installed leak detection equipment (see attached waste oil sheet)?

- For hazardous waste (non-waste oil) underground accumulation tanks, see 310 CMR 30.690.

HW: RECYCLING ACTIVITIES (SQG/LQG)

(1) Does the facility recycle, reclaim or reuse any wastes on-site?

If yes, and the recycling is not permitted, describe the activity and use existing permit applicability guidance to determine the need for a permit.

INSPECTION GUIDANCE #18
HAZARDOUS WASTE: RECORD REVIEW

(1) Are manifests used for all hazardous waste shipped off-site and retained for three years from the date of shipments? (Manifests should be reviewed for at least three random months.)

Has the generator exported any wastes out of the United States?

Does the generator complete Land Disposal Restriction notifications (LDR notifications are used to indicate to the receiving facility that the generator's waste is restricted from land disposal (** except for waste oil and PCBs **)?

(2) Does the owner/operator have a written personnel training plan? (LQG ONLY)

(3) Has the owner/operator conducted annual training? (LQG ONLY)

(4) Does the facility have a contingency plan? (LQG ONLY)

Has the plan been updated (if; the plan fails in an emergency, the emergency coordinators change, the emergency equipment changes, there is a change in operation or maintenance at the facility)?

Has there been an emergency in which the plan was used? If yes, were all applicable requirements and response measures followed (e.g. releases reported, spill cleaned up and managed/disposed of properly, etc.)?

Has the facility ever filed a MA Annual TUR Report for Toxic Substance Use? **(Fed-Form R, State-Form S and State-Fee)**

Yes __ (Go to Box 2) No __ (Go to Box 1)

Box 1 - Does the facility need to file a MA TUR Report?

A. Are there 10 or more full time employee equivalents?
(2,000 hrs/year/employee full or part-time including consultants)

Yes _____ No*_____ Unclear*_____
***If No then Inspection is complete**
***If unclear then revisit if B&C are yes**

B. Are activities within Standard Industrial Classification (SIC) Codes 20 - 39, 10 - 14, 40, 44 - 51, 72, 73 and 76?

Yes _____ No*_____
***If no then inspection is complete**

C. Does the facility manufacture or process ≥ 25,000 lbs. or otherwise use ≥10,000 lbs. of at least one toxic substance?
(If the company is uncertain about usage, ask them to evaluate amounts according to the Form S Guidance and/or the EPCRA Form R Worksheet, and submit amounts in writing to inspector indicating whether or not they need to file.

Toxic chemicals - SARA 313 and CERCLA chemicals.

Note: Count toxic chemicals in pure form and in mixtures. Look at each constituent in a mixture, add the content of the constituent in the mixture to the amount of the chemical in pure form (if any) to determine if together they exceed the threshold. See MSDSs and purchase/use records, if needed.)

Yes ____ No*____
***If no then inspection is complete**

D. Does the facility manufacture, process or otherwise use ≥10,000 lbs. of any other toxic substance(s)?

Yes _____ No _____

For C. and D., if yes, note the most recent year the toxic substance(s) was used, the toxic substance(s) and approximate amounts:

Year	Toxic Substance(s)	Approximate Amounts

Box 2 - Companies who have Filed TURA Annual Reports

1. Did the facility fail to file a TUR report for any toxic substances ≥ 10,000 lbs. that were not included in the most recent year's report (see pre-inspection report)? (Look at pure chemicals and mixtures in all parts of the plant including storage and handling, process lines, cleaning operations and waste management.)

If yes, note the most recent year the toxic substance(s) was used, the toxic substance(s) and approximate amounts:

Year	Toxic Substance(s)	Approximate Amounts

2. Does the facility have a TUR plan on-site?
Yes*_____ No*_____
***If yes go to 3**
***If No, TURA section is complete**

3. Does the facility have a TUR plan on-site that has been certified by a Senior Facility Manager and Toxics Use Reduction Planner?

Yes*_____ No*_____
***If yes then is the TURP certified and the same as the TURP on the plan summary? Yes____ No____**
***If No then check off the following:**

No Signature	TURP____	Manager____
No Statement	TURP____	Manager____
Wrong Statement	TURP____	Manager____

4. Does the plan include the following:

A) A description of the steps the company took to notify its employees:
Yes _____ No _____

B) Management Policy:
Yes _____ No _____

C) Scope of Plan:
Yes _____ No _____

5. Select a production unit chemical combination.

A) For the selected production unit/chemical combination, does the plan include at least one process flow diagram (PFD) labelled with chemical(s) inputs and outputs?
Yes _____ No _____ No PFD*_____
***If no PFD go to 6**

B) For the PFD, do you find that the inputs and outputs labelled on the PFD match those that are actually in the process?
Yes _____ No _____

C) For the chemical used in the process described by the PFD, are there figures and calculations available for use, byproduct and emissions?
Yes*_____ No*_____
***If yes then do the calculations appear to support the figures? Yes ___ No ___**
***If no then go to 6.**

D) Is there backup documentation for the calculations?
Yes _____ No _____

6. For the chemical/production unit selected above did the plan include the following:

A) Toxics Use Reduction Options
Yes*_____ No*_____
*** If yes go to 6.B)**
*** If no go to 7.**

B) A Description of the Options Identification Procedure Yes _____ No _____

C) Was there a (one phrase to 1 paragraph) justification for each option screened out as inappropriate?
Yes _____ No _____

7. For one option that was **appropriate** (i.e. an option that was not screened out for being clearly technically or economically infeasible), did the plan include the following:

- Economic Evaluation of Option Yes ____ No ____
- Technical Evaluation of Option Yes ____ No ____

8. For the selected production unit/chemical combination is there a cost of toxic calculation?
Yes ____ No_____

9. During your inspection and Plan Review did you find any indication that an additional TURA specialist inspection is necessary in order to determine that the company made a good faith effort at Toxics Use Reduction Planning?

Yes*____ No ____

***If yes, please describe in the space below**

INSPECTION GUIDANCE #20
POLLUTION PREVENTION

1. Look for (obvious/significant) P2 opportunities at each process:

   General: Items not related to any one particular process such as covering of solvent containers to reduce evaporation, drip boards to reduce drag out, housekeeping improvements, etc. (Note that any evidence of spills/leaks indicates a process inefficiency and a P2 opportunity.)

   Specific: Items specific to the process at the facility such as replacement of solvent cleaner with aqueous, use of low or no VOC coatings, etc.

   Consider all obvious/significant P2, including TUR, solid waste, water, and energy.

2. Consider each generation point when thinking about P2. Specifically, why is this waste being generated and what has been considered/could be done differently to reduce it at the source?

3. Communicate P2 information/opportunities via any of the following applicable mechanisms:

   A. Orally communicate general and/or specific P2 opportunities while at facility.
   B. Distribute general P2 literature while at the facility emphasizing the importance of the facility conducting it's own efficiency/P2 self evaluation/planning process.
   C. Distribute promotional literature on the Massachusetts Office of Technical Assistance (OTA) and/or WasteCAP.
   C. Through distribution of industry-specific or process-specific prepared literature (OTA case studies, other sources) to show real-world applications.
   D. In compliance letters.
   E. In enforcement products:
      1. NON cover letters (see DEP/BWP Boilerplate NON),
      2. In the body of higher enforcement (ACOs),
      3. Copying all enforcement documents to OTA, who then contact the facility and ask if they can provide their services.

FIRST Compliance Evaluation Inspection Form

FACILITY NAME _____

INSPECTION DATE _____ FACILITY CONTACT(S) _____

DEP STAFF _____ INSPECTION FORM DATE _____

OBJECTIVE OF THE INSPECTION _____

_____

COMPLIANCE ASSESSMENT According to the guidelines of the protocol, Was any non-compliance found in:

Air Quality	☐ Yes	☐ No
Industrial Waste Water	☐ Yes	☐ No
Hazardous Waste (RCRA)	☐ Yes	☐ No
TURA	☐ Yes	☐ No
Solid Waste	☐ Yes	☐ No

Referral needed to other program _____

BRIEF VIOLATION SUMMARY _____

_____

_____

Describe all violations in detail in the violation section of the associated Unit or Waste Mgt. Operation.

BRIEF SOURCE REDUCTION SUMMARY _____

_____

_____

Describe observed source reduction opportunities in the appropriate section of the associated Unit or Waste Management Operation.

CONCLUSIONS AND RECOMMENDED FOLLOW-UP _____

_____

_____

FIRST Compliance Evaluation Inspection Form

FACILITY NAME _____ INSPECTION DATE _____

GENERAL FACILITY DESCRIPTION Provide a general description of the facility. (Attach the FMF Pre-Inspection and Post-Inspection Reports, which provide additional information.)

NOTES/COMMENTS

(Use additional pages for notes as needed.)

Facility Name:_____ FIRST CEI FORM

Inspection Date:_____ Page___ of ____

INPUTS	UNIT OPERATIONS OR WASTE MGT OPS.	OUTPUTS

VIOLATIONS:_____

SOURCE REDUCTION OPPORTUNITIES:_____

INPUTS	UNIT OPERATIONS OR WASTE MGT OPS.	OUTPUTS

VIOLATIONS:_____

SOURCE REDUCTION OPPORTUNITIES:_____

Facility Name:_____ FIRST CEI FORM

Inspection Date:_____ Page____ of ___

INPUTS	UNIT OPERATIONS OR WASTE MGT OPS.	OUTPUTS

VIOLATIONS:_____

SOURCE REDUCTION OPPORTUNITIES:_____

FIRST CEI INSPECTION MEMO

Date:

To: The File

From:

Cc: _____, BWP RE, DEP/CERO
_____, BWP C/E, DEP/CERO
_____(other cc.s)
_____(other cc.s)
(POTW Pretreatment Coordinator -- if sewered)
(Any other agencies/entities participating in inspection)

Enf: (yes) (no) (?)

Re: _____
(facility name)

On (date)_____, (inspectors)_____ _____ conducted an inspection of (facility)_____ located at (address, note if two)_____ in _____. (Briefly describe layout, i.e. if the company is in two buildings.) _____

_____

The objective of the inspection was _____

_____
(e.g. to verify the company's compliance with the Department's regulations).

Mr/Ms(s)_____ were contacted on (date)_____, prior to the inspection. On the day of the inspection, Mr/Ms(s)_____ conducted a tour of the installation.

VIOLATION SUMMARY

There were violations associated with _____

_____

_____

_____.

SOURCE REDUCTION SUMMARY

I observed some opportunities for source reduction in the

_____operations(s).

(Facility Name)_____
FIRST CEI INSPECTION MEMO

MANUFACTURING PROCESSES

The company.... (briefly describe products made etc.)

_____
_____
_____
_____.

UNIT OPERATION/ WASTE MANAGEMENT SUMMARY

There were (number)_____ unit operations and (number) _____ waste management operations identified at this facility.

UO#1 -
UO#2 -
UO#3 -
UO#4 -
UO#5 -
WMO#1 - Hazardous Waste Accumulation Area(s)
WMO#2 -
WMO#3 -

UO#/WMO# - _____ (UO Name or WMO Name)

(UO or WMO Description, and Associated Violations and Source Reduction Opportunities)_____
_____
_____
_____
_____

Substances: _____Substance 1 (____ approx qty/year)
_____Substance 2 (____ approx qty/year)
_____Substance 3 (____ approx qty/year)
_____Substance 4 (____ approx qty/year)

Waste Streams: Air - _____
_____
_____
Water - _____
_____
_____.
Hazardous _____
_____
_____
Solid - _____
_____
_____

SAMPLE

FIRST CEI INSPECTION MEMO

Date: May 24, 1993

To: The File

From: Doug Fine, Martha Caldwell

CC: Michael Maher, BWP RE, DEP/CERO
John Kronopolus, DHW, DEP/CERO
Doug Fine, BWP RCC, DEP/CERO
Joe Hogan, Upper Blackstone Water Pollution Abatement District

RE: Kennedy Die Casting
15 Coppage Drive, Worcester, MA

Facility and Program Classification: See attached FMF Pre-Inspection Report and FMF Post-Inspection Report.

On May 11, 1993, Martha Caldwell and Doug Fine conducted an unannounced inspection of Kennedy Die Casting (Kennedy) located at 15 Coppage Drive in Worcester. The facility is the sole occupant of a large building located in an industrial park.

The objective of the inspection was to verify the company's compliance with the Department's regulations. Specifically, Department staff confirmed the facility's large quantity generator status for waste oil and checked for compliance with large quantity generator (waste oil) requirements. Department staff also screened for unregistered activity in air quality and industrial wastewater, and screened for potential filing under the toxics use reduction act.

On the day of the inspection Mr. Joe Deliso (Operations Manager) and Mr. Richard Cocilova (Facility Maintenance and Safety) conducted a tour of the installation.

VIOLATION SUMMARY

Hazardous Waste: There were numerous violations associated with waste oil management requirements including poor container condition, open containers, inadequate container labelling,

improperly marked area, inadequate aisle spacing, no impervious surface, inadequate emergency preparedness and response plan, failure to conduct weekly accumulation area inspections, illegal disposal of hazardous waste (overfilling of drums), and accumulation for more than the 90 day maximum. Kennedy has failed to register as a very small quantity generator of hazardous waste (spent mineral spirits from two Safety Kleen unit).

Industrial Wastewater: When Kennedy moved from Harding Street to its current location in 1987 they failed to obtain a sewer connection permit from the Department.

Air Quality: Kennedy has been asked to submit a Source Registration form to determine applicability to air quality regulations.

Toxics Use Reduction Act: Department staff are conducting an initial investigation regarding the likelihood that Kennedy tripped the 25,000 pound per year threshold for manufacturing zinc and aluminum fume or dust. (They process approximately 1.5 and 0.5 million pounds of aluminum and zinc annually.)

Proposed Enforcement: Formal enforcement will be conducted, probably an administrative consent order (ACO) or an ACO with penalty. DEP is awaiting submittal of Kennedy's air quality source registration (SR) form before finalizing any enforcement action. Kennedy's SR is expected to arrive at DEP by 5/28/93.

SOURCE REDUCTION SUMMARY

There may be some source reduction opportunities associated with Kennedy's use of kerosene for machinery cleaning. Stepped up casting-machine maintenance may also reduce discharges of hydraulic fluid to the wastewater stream and the floor/Speedi-Dry.

MANUFACTURING PROCESSES

Kennedy manufactures a range of zinc and aluminum parts (traffic light housings, abrasive wheel casings, electrical housings, ratchets, etc.). The manufacturing process includes melting of aluminum and zinc ingots, casting/molding of parts, parts trimming, parts machining (drilling, tapping, etc.), and parts finishing (shot blasting or vibratory).

UNIT OPERATION/ WASTE MANAGEMENT SUMMARY

There were five unit operations (UO#1-5) and two waste management operations (WMO#1-2) identified at this facility:

UO#1-Melting
UO#2-Casting
UO#3-Drilling/Tapping/Machining

UO#4-Finishing
UO#5-Misc. Machinery Cleaning
WMO#1-Oil/Water Separation
WMO#2-Waste Oil Accumulation Area(s)

UO#1 - Melting

Zinc and aluminum ingots are melted (separately) in two large, natural-gas fired reverberatory furnaces. Each furnace has a separate stack through the ceiling. Neither stack has any controls. Scrap zinc and aluminum from the trimming and machining operations are also melted for re-processing. One of the two furnaces was currently off-line but is expected to come back on line later this year. The molten metal is poured from the furnace(s) into transfer ladles and carried to one of 17 gas-fired holding furnaces located at each of the casting machines. These 17 holding furnaces each have a capacity of 600 to 800 pounds of metal, and are vented to the ambient air and then to vents in the ceiling.

Substances: Aluminum (approx 1.5 million lbs/year)
Zinc (approx 0.5 million lbs/year)
Natural Gas
Oil/Dirt Contamination on Metal Feedstock

Waste Streams: Air - NOx(?)
Occasional visible emissions
Zinc and aluminum particulate (fume or dust).

UO#2 - Casting

Molten metal is automatically ladled from the holding furnaces into a shot sleeve, then injected under pressure into the die. The die is cooled by non-contact cooling water flowing through the casting machine, which is recirculated in a cooling tower located on the roof of the facility. After a cycled time, the die mold opens up and an operator removes the hot part and re-melts any trimmed gates and runners in the holding furnace. Some parts are cooled in tubs of contact cooling water, which are discharged to the sub-floor trench. The operator then sprays a water- soluble die lubricant onto the die. The majority of this lubricant evaporates off or stays on the die, with some runoff to the floor. From the floor, the waste lubricant enters the sub-floor trench. Wastewater in the subfloor trench flows to the oil/water separator (WMO#1).

There are frequent leaks of water soluble hydraulic fluid from the molding machines. Pans are used to collect leaking hydraulic fluid until maintenance can make repairs. Any leaking hydraulic fluid not caught by a pan enters the floor trenches and flows to the oil/water separator.

Zinc and aluminum that has spilled and dripped during casting is collected from in and around the casting machines at the end of each shift. The majority of this metal is "recycled"

in the reverberatory furnaces. (Metal that is too contaminated to be re-melted is shipped to reclaimers/smelters, one of which is State Metal.)

Substances:
- Molten Aluminum and Zinc
- Water Soluble Die Lubricant
- Water Soluble Hydraulic Fluid
- Non-Contact Cooling Water
- Contact Cooling Water

Waste Streams:

Air -
- Water Soluble Die Lubricant (Evaporating off dies)

Water -
- Water Soluble Die Lubricant, with Some Zinc and Aluminum Contamination
- Water Soluble Hydraulic Fluid
- Contact Cooling Water (some zinc and aluminum contamination)

Solid -
- Aluminum and Zinc Waste, Including Gates and Runners (often contaminated with die lube and hydraulic fluid)
- Speedi-Dry Contaminated with Waste Hydraulic Oil, etc.

<u>UO#3 - Drilling/Tapping</u>

Many parts require machining (drilling and tapping) before shipment. This is done both manually and automatically, depending on the nature and extent of the machining required. For both manual and automatic machining, the drills and tapping heads are sprayed with a very fine mist of (water soluble?) lubricant. The residual lubricant left on the part is so minimal that the part does not require any cleaning before shipment. All drills and tapping machines are run off of one compressor.

More extensive machining is done in a self-contained automated milling and boring machine (Pratt & Whitney Fanuc Tap Drill Mate). Inside this unit, the parts are flooded with a (water soluble) lubricant, which is recirculated within the unit. This lubricant is periodically removed from the unit and shipped off-site (as hazardous waste?).

Any metal chips from machining go to a dross hopper (and are sent off-site for reclamation/reprocessing?).

Substances:
- Un-machined Aluminum and Zinc Parts
- Water Soluble Lubricant

Waste Streams:

Air -
- Small amounts of water soluble lubricant.

Haz. -
- Waste Lubricant from Pratt & Whitney Automated Milling Machine

Solid -
- Zinc and Aluminum Chips

UO#4 - Finishing

Parts requiring finishing are finished in either an enclosed shot-blasting unit or in a vibratory finishing operation.

Steel shot from the shot-blasting cabinet is recirculated for re-use. Dust is vacuumed to a stack house outside where it settles and is disposed of as solid waste.

In the vibratory finishing operation, castings are tumbled with a ceramic media in an open tumbler with a water and soap solution. The soapy water discharged from the tumbler goes to a settling tank, then to a holding tank, then to a centrifuge, and then it is returned to the tumbler. Sludge is collected at the centrifuge, where it will be removed for shipment off-site. Kennedy plans their first shipment of sludge within the next month (the vibratory system came on line eight months ago). Kennedy expects that the sludge will be solid waste, but they will have it analyzed prior to shipment.

Substances: Un-finished Aluminum and Zinc Parts
Steel Shot
Ceramic Tumbling Media
Water
Soap

Waste Streams: Solid - Steel/Aluminum/Zinc Dust from Shot-Blasting (vacuumed and settled)

Soap/Ceramic/Zinc/Aluminum Sludge

UO#5 - Miscellaneous Machinery Cleaning

Machines are steam-cleaned and hand-cleaned on location with kerosene. Kennedy uses approximately 250 gallons/year of kerosene, which is stored behind the building in an above-ground 275 gallon tank.

Removable machine parts are cleaned in two Safety-Kleen units.

Substances: Kerosene
Mineral Spirits in Safety-Kleen Unit

Waste Streams: Air - Kerosene

Haz. - Spent Mineral Spirits

Solid(?)- Cleaning Rags(?)

WMO#1 - Oil-Water Separation

Approximately 1,000 gpd of waste water-soluble die lubricant, waste water-soluble hydraulic fluid, and a small

amount of contact cooling water flows below the shop floor to a covered, in-floor settling pit at the rear of the main facility. It then flows to a second pit where oil is skimmed. This second pit is located under the floor of a small, locked skimmer-room building attached to the rear/outside of the facility. As oil is skimmed from the second pit it is pumped up into 55 gallon barrels located in this skimmer room. Wastewater then flows back into the rear of the main facility to a third and final in-floor pit where all necessary sampling occurs prior to discharge. Wastewater is sampled for FOG and zinc, and flow is continuously monitored. Kennedy staff thought all pits were constructed of concrete.

Kennedy staff stated that they have in the past failed to be in compliance with UBWPAD's limits for FOG and zinc, but they are now in compliance. Kennedy staff noted that they are currently out of compliance with Federal categorical FOG limits.

Kennedy is researching use of microbiotic treatment for this oily wastewater and hopes to move to zero-discharge operations.

WMO#2 - Waste Oil Accumulation Area

Waste oil is accumulated in two areas; one located in the rear of the main facility and one located in the skimmer room. There were approximately fifteen 55 gallon drums located in the main facility area and approximately five drums located in the skimmer room. There were numerous management violations associated with both areas (see Violation Summary above), including bulging drums, drums with open bungs, and drums with waste oil pooled on top (from overfilling in the skimmer room). Department personnel discussed the possibility of Kennedy utilizing an automatic shut-off device in the oil skimming operation as a means to eliminate overfilling.

Appendix I

AIR QUALITY SOURCE CATEGORIES

PROCESS	DATE	APPLICABILITY LIMITS
Metal Furniture Coating	1982	sources with ≤ 15 lbs/day emissions are exempt
Metal Can Coating	1982	sources with ≤ 15 lbs/day emissions are exempt
Large Appliance Coating	1982	sources with ≤ 15 lbs/day emissions are exempt
Magnet Wire Insulation Coating	1982	sources with ≤ 15 lbs/day emissions are exempt
Automobile Surface Coating	1982	sources with ≤ 15 lbs/day emissions are exempt
Metal Coil Coating	1982	sources with ≤ 15 lbs/day emissions are exempt
Surface Coating of Misc. Metal Parts and Products	1982	Sources < 10 tons/yr of emissions are exempt
Graphic Arts	1982	sources with potential emissions < 50 tons/yr are exempt
7.18(14) Paper Surface Coating	1982	sources with ≤ 15 lbs/day emissions are exempt
Fabric Surface Coating	1982	sources with ≤ 15 lbs/day emissions are exempt
Vinyl Surface Coating	1982	sources with ≤ 15 lbs/day emissions are exempt
Polystyrene Resin Manufacture	1983	sources with ≤ 15 lbs/day emissions are exempt
Synthetic Organic Chemical Manufacture	1983	all facilities manufacturing organic chemicals

Surface Coating of Plastic Parts	2/12/93	Sources with potential emissions < 50 tons/year are exempt Sources using add-on air pollution control equipment have different limits. Refer to the regulation.
Leather Surface Coating	2/12/93	Sources with potential emissions < 50 tons/year are exempt
Wood Products Surface Coating	2/12/93	Sources with potential emissions < 50 tons/year are exempt
Flat Wood Paneling Coating	2/12/93	sources with ≤ 15 lbs/day emissions are exempt
Lithographic Printing	2/12/93	Sources with potential emissions < 50 tons/year are exempt
Textile Finishing	2/12/93	Sources with potential emissions < 50 tons/year are exempt
Coating Mixing Tanks	2/12/93	required at any source that must comply with any of the other categories

Other possible industrial standards not included:

Dry Cleaning
Motor Vehicle Dispensing Facilities
Cutback asphalt
Organic Material Storage and Transportation

BWP Policy Number BWP-95-007

Measures of Success

COMMONWEALTH OF MASSACHUSETTS
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MEASURES OF SUCCESS

Bureau of Waste Prevention
Policy BWP-95-007

Patricia Deese Stanton, Assistant Commissioner

July 20, 1995

Policy Statement

BWP is developing new measures to demonstrate the impact of its activities on the environment. This policy contains guidance for calculating the new measures that BWP will implement during FY96. This is an interim policy to test the feasibility of using these measures.

Some of the new measures of success directly link BWP activities to reductions in volumes of waste released to the environment. Using these measures, the Bureau will begin to be able to test the assumptions on which its activities are based. As the Bureau's level of knowledge about the relationship between its activities and specific changes in releases of pollutants rises, it will begin to learn definitively what impact its programs have on the environment. That knowledge will enable it to tailor its activities so that they result in the greatest gain.

Background Statement

Traditional measures of success do not reflect BWP's progress in fulfilling its mission. New measures are needed that reflect the Bureau's impact on the environment, better gauge its efforts to achieve its mission, and enable it to communicate its tangible achievements to various internal and external audiences.

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From the time when it began to record its progress, BWP has tracked its accomplishments by counting its activities. Implicit in that methodology has been the assumption that the Bureau's continuing to engage in its regular activities -- permitting, compliance, and enforcement -- would result in environmental gain.

For example, the methodology assumes that BWP's conducting inspections causes facilities to act in ways that lessen their negative impacts on the environment. With that as a starting point, it follows that conducting a greater number of inspections would result in less and less negative environmental impact, so the historic measure of success has been the number of inspections, and the associated untested assumption has been that an increase in the number of inspections necessarily meant an increase in environmental benefit. While there may not, in fact, be any reason to doubt the assumption, BWP does not yet have sufficient data to support it. The new measures of success are intended in part to fill in that data gap.

In developing the measures of success described in this policy, the Bureau considered a range of potential measures some of which appear in the table and are described in detail below. The primary criterion for inclusion in the group was whether a measure was a better indicator of the Bureau's impact (environmental, regulatory, or economic) than measures currently in use. For that reason, some of the measures continue to be activity measures, but they are more accurate or descriptive measures than the ones BWP uses now, and several are much more closely related to environmental impact than are activity measures currently in use.

The list also includes a number of direct measures of environmental impact. These measures quantify reductions of pollutants released into the environment. These are BWP's first attempts at quantifying statewide the environmental impact of its permitting, compliance,and enforcement activities.

Approximately three months after full implementation of all Phase I measures, BWP will review measures of success data collected to that point to examine what it reveals about the impact of the Bureau's programs. This analysis will be the starting point for revision of guidance for Phase I measures. It may also point to a need to revise some part of the implementation of Phase II measures.

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Guidance

Below is a table listing the new measures that the Bureau intends to implement. The measures in the table marked as 'Phase I' measures will be implemented beginning July 1, 1995. The implementation schedule assumes a three-month trial period during which the guidance for calculating measures of success will be refined based on the observations of inspectors and permitters using real data from the field. All Phase I measures will be fully in use by October 1, 1995. The measures marked 'Phase II' are projected to be implemented beginning January 1, 1996. Presumably, the guidance for these measures will require a similar trial period.

Most of the challenges in implementing these measures will be in calculating them. Most of the activity measures should involve only straightforward calculation. However, the environmental measures are complex and previously untried; they will require determining previously unknown release baselines.

Training is being developed now to instruct staff in how to calculate the measures and to enter them into the Facility Master File. As part of implementing the new measures, BWP is committed to using its computerized information systems, so all measures will be required to be entered into FMF except where the guidance notes that a different system will be used.

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LIST OF POTENTIAL MEASURES OF SUCCESS

Measure	Phase 1	Phase 2
I. Environmental Impact/Pollution Reduced		
A. Amount of pollution reduced due to printer Common Sense Initiative project		x
B. Waste diverted from disposal due to Beneficial Use Determinations (SW)		x
C. Landfill leachate prevented due to closure (SW)	**x**	
D. Reduction in HW generated as self-reported by facilities requesting a change in status from LQG to SQG or VSQG (HW)	**x**	
E. Reductions in emissions due RACT (AQ)		
1. NOx emissions	**x**	
2. VOC emissions	**x**	
F. Reductions in emissions under BACT (AQ)		x
G. Releases and byproduct reduced due P2 (TUR)		x
H. Raw materials not needed due to P2 (TUR)		x
I. Change in volume of waste streams that were unregulated prior to a performed action		
1. TURA chemicals	**x**	
2. Other wastes	**x**	
II. Compliance Status		
A. % of facilities in compliance at the time of inspection	**x**	
B. % of facilities in compliance at close of compliance schedule or enforcement deadline		x
C. Ratio of "severe" violations to all violations		x

D. Number of unregulated waste streams identified	**x**	
E. Volume of waste streams unregulated prior to a performed action		
1. TURA chemicals	**x**	
2. Other wastes	**x**	
III. Industry Benefits		
A. Mitigated penalties invested in source reduction/pollution prevention	**x**	
B. Money projected to be saved by facilities due to P2		x
C. Permits no longer needed due to P2		x
IV. Level Playing Field		
A. Penalties assessed	**x**	
B. Penalties collected	**x**	
C. New annual compliance fees to be paid by outlaws brought into the system	**x**	

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Guidance for Calculating Measures of Success

Measure I.A. Amount of pollution reduced due to Printer CSI project [Phase 2]

What does this measure mean?

The Common Sense Initiative Printer project will test a new methodology for providing compliance assurance in the printing sector. This measure will allow us to view the environmental benefits of this project in terms of reductions in air and water pollution and in the amount of hazardous waste generated.

Protocol: to be determined

Example: to be developed

Measure I.B. Waste diverted from disposal due to Beneficial Use Determinations (SW) [Phase 2]

What does this measure mean?

Protocol:

Example:

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Measure I.C. Landfill leachate prevented due to closure (SW)

What does this measure mean?

As landfills are closed and capped, the generation of leachate, which occurs when water infiltrates through a landfill, is reduced. This measure will allow us to calculate the environmental benefits of closing landfills and reducing leachate generation.

Protocol:

The amount of leachate reduced due to closure of unlined landfills can be calculated using the following table, which shows leachate generation rates associated with landfill cap types:

Cap Types

1. No cap (sandy daily cover only on irregular surface)
2. 10^{-5} permeability cap
3. 10^{-7} permeability cap. [Standard DEP cap].

Leachate Generation Rates

Cap Type	gal/ac-d rate	gal/ac-yr rate
No cap	1,730	631,000
10^{-5}	702	256,000
10^{-7}	84	31,000

These numbers provide relative reductions in leachate generation when a site is capped.

Example:

How much leachate is prevented from entering the groundwater each year as a result of capping 21 acres of the Carver-Marion-Wareham unlined landfill? Soil of less than 10-7 cm/sec permeability was used as the impermeable barrier layer. Using values from the chart above:

1. No cap:
leachate = 631,000 gal/acre/year x 21 acres = 13,251,000 gal/year
2. With cap:
leachate = 31,000 gal/acre/year x 21 acres = 651,000 gal/year

Annual gallons leachate reduced due to closure of Carver-Marion-Wareham landfill: 13,251,000 - 651,000 = 12,600,000

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Measure I.D. Reduction in volume of HW generated by facilities which lower their generator status in order to return to compliance

Part (1)
What does this measure mean?

When a facility reduces its status from Large Quantity Generator (LQG) to Small Quantity Generator (SQG) or Very Small Quantity Generator (VSQG) or to zero, or from SQG to VSQG or zero, or from VSQG to zero, the environment benefits by the amount of the decrease in contaminant loading. This measure will allow BWP to calculate the environmental benefit of encouraging a facility to reduce its status.

Protocol:

If, following an enforcement action, a facility proposes a reduction in status as part of its return to compliance, it then estimates the reduction in hazardous waste which will result from the status change. The reduction in volume of hazardous waste generated by a facility which changes its status can be calculated as follows:

During post-enforcement verification reinspection following a change in status, inspectors should ask facilities to estimate their projected reduction in hazardous waste generation.

--- OR ---

During post-enforcement verification reinspection following a change in status, inspectors should review hazardous waste shipping manifests (if this is a normal part of the verification reinspection) from before and after the change in status to determine the actual quantity of hazardous waste reduced.

Use units (kilograms, pounds, gallons) as indicated by the facility. Using a best, conservative estimate, project reductions out for the next 12 months (one year).

Example:

Kimbo Corp., formerly an LQG generating an estimated 1,500 kilograms (kg) per month of hazardous waste, has proposed a change in status from LQG to SQG (limited to 100 to 999 kg/month) as part of its plan to achieve compliance following a DEP enforcement action. During verification reinspection, the inspector asks Kimbo for data estimating the amount of hazardous waste previously generated as an LQG compared to the amount now generated as an SQG. Kimbo estimates that 1,500 kg were formerly generated per month

whereas about 850 kg per month are generated now.
(1,500 kg - 850 kg) X 12 months = 7,800 kg/year reduction

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Measure I.D. Number of facilities which reduce their Hazardous Waste generator status shortly after a Compliance/Enforcement action

Part (2)

What does this measure mean?

In addition to estimating the volume of hazardous waste reduced due to reduction in status (e.g., from LQG to SQG), count the number of status changes (e.g., from LQG to SQG) following an inspection or enforcement action. Any reduction in status by a facility is an environmental benefit due to the decreased hazardous waste loading (actual or potential) on the environment. This measure will serve as an indicator of the number of facilities which "got the message" about pollution prevention from a Bureau of Waste Prevention, Compliance/Enforcement action.

Protocol:

This measure can be calculated automatically from data input into the Facility Master File (FMF) for other purposes. Inspections, enforcement actions, and status changes should be logged into FMF as usual. At year end, FMF will calculate the number of facilities which reduced their hazardous waste generator status within 3 months of an inspection or an enforcement action (date the enforcement action was issued).

Example:

FMF will automatically determine this figure through the following procedure:

1. At a given facility, did a status reduction occur?
2. Was the status change date within 90 days following an inspection date or enforcement action date?
3. If "yes" to both questions, add 1 to the total number of status reductions.

If required, this procedure could be modified to track the 6 possible status reductions separately:

From	To
LQG	SQG
LQG	VSQG
LQG	0
SQG	VSQG
SQG	0
VSQG	0

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Measure I.E. Reductions in emissions due to RACT

What does this measure mean?

Reasonably Available Control Technology (RACT) permits require air pollution sources to implement certain techniques to reduce air emissions. This measure will provide information on the environmental benefits of imposing RACT requirements on specific sources in terms of the actual reductions in air emissions achieved.

Protocol:

1990 emissions from SSEIS for the emission units included which are subject to RACT requirements are used as a baseline.
The reduction in tons per year due to RACT is equal to:

$$\text{Reduction} = (\text{1994 emissions}) \times \frac{(\text{1994 emission rate}) - (\text{RACT emission rate})}{(\text{1994 emission rate})}$$

For reductions in NOx due to RACT permits, use SSEIS and source data on NOx emissions; for reductions in VOC due to RACT, use SSEIS and source data on VOC emissions.

NOTE: Even though 1990 data is used in the SIP, for most sources the data we'll have in SSEIS will be for 1994. Where information isn't available in SSEIS, we'll need to get that from source files in Regions.

Example:

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Measure I.F. Reductions in emissions under Best Available Control Technology [Phase 2]

What does this measure mean?

Certain air permits require an analysis of Best Available Control Technology (BACT) options. In BACT analysis, options for reducing air emissions (including implementing controls and pollution prevention techniques) are studied, and an appropriate technology is selected and implemented. Economic considerations (per unit reduction costs) are included in BACT analysis.

Protocol: to be determined

NOTE: Several issues need to be addressed in developing this protocol. First, DEP often does not know at what level the source would have emitted without the BACT requirement. For example, would they have constructed with no controls at all? In cases where there is an applicable RACT requirement, should RACT be the baseline or should no controls be the baseline?

Second, what values should be used for capacity utilization? Most facilities only utilize a fraction of their total capacity. If we assume worst case (no controls without review and facility operating at maximum capacity (potential emissions)) the amount of reduction due to review will be over stated.

Example: to be developed

Measure I.G. Releases and byproducts reduced due to P2 (TUR) [Phase 2]

What does this measure mean?

Protocol:

Example:

Measure I.H. Raw materials not needed due to P2 (TUR) [Phase 2]

What does this measure mean?

Protocol:

Example:

Measure I.I. Change in volume of waste streams that were unregulated prior to a performed action

What does this measure mean?

Once an unregulated waste stream is discovered, DEP may take a number of actions, including imposing regulations, requiring permits, registration, or certifications. This measure will enable DEP to determine the environmental impact of these actions. Environmental impact will be measured in terms of the changes in waste stream volume. The impacts of the action on TURA chemicals and other chemicals will be measured separately.

Protocol:

1. TURA Chemicals

A three step process should be used:
- o Determine the actual baseline emissions of TURA chemicals for the unregulated waste stream.
- o Determine the actual post-action emissions.
- o Calculate the difference between the two.

2. Other Wastes

A three step process should be used:
- o Determine the actual baseline non-TURA chemical emissions for the unregulated waste stream.
- o Determine the actual post-action emissions.
- o Calculate the difference between the two.

Example:

A coating line is found without a required VOC RACT permit (unregulated). The VOC is a TURA chemical. The facility response is to obtain a RACT permit and implement RACT.

The actual baseline unregulated emission is calculated, the actual final emission level is calculated, and the difference between the two is the measure of success:

Unregulated waste stream: 87 Tons/year
RACT action taken level: 51 tons/year
Difference: 36 tons TURA chemical/year

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II.A. Percent of facilities in compliance at the time of initial inspection (i.e., no enforcement action taken)

What does this measure mean?

Facilities which are in compliance with DEP and EPA regulations at the time of inspection are not causing an illegal environmental burden. This measure is an indicator of DEP's ability to deter contaminant loading through regulation and compliance activities, and also indicates DEP's effectiveness in targeting noncompliant facilities for inspection.

Protocol:

Beginning July 1, 1995, the Facilities Correspondence Log function (FCLMNT) of the Facilities Management File (FMF) will be used to post the "in compliance" status of a facility following an inspection where no enforcement is required using the code COMP. If a facility received an enforcement action, initially the code ENF is used to indicate this action, then the "return to compliance" status of the facility is posted following a verification reinspection using the code RTC. FMF will report the number of inspected facilities with the code COMP (i.e., in compliance initially), divided by the sum of inspected facilities with the code COMP and inspected facilities with the codes ENF and RTC (i.e., enforced against).

Example:

$$\frac{COMP}{COMP + ENF + RTC} \; X \; 100 = \% \; COMPLIANCE$$

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II.B. Percent of facilities in compliance at verification reinspection [Phase 2]

What does this measure mean?

Facilities which were found to be out of compliance and which then return to compliance may have reduced the contaminant burden on the environment. This measure is an indicator of DEP's ability to inspect for and enforce DEP and EPA regulations, and of DEP's effectiveness at getting violators to come into compliance in a timely fashion.

Protocol:

When an enforcement action is issued following an inspection, the deadline for return to compliance is entered into the Facility Enforcement Maintenance function (FENFMNT) of the Facilities Management File (FMF) as the "due" date. Staff then verify return to compliance through reinspection. After verification reinspection, assuming the facility has returned to compliance, staff post the verification date into FENFMNT as the "closed" date. FMF will report the number of facilities where the "closed" date is the same as or earlier than the "due" date (i.e, in compliance at verification reinspection), divided by the sum of facilities where the "closed" date is the same as or earlier than the "due" date plus those where the "closed" date is after the "due" date (i.e., not in compliance at verification reinspection).

For those situations where a verification reinspection does not occur (for example, due to receipt of a Return To Compliance letter allowed from some facilities), it must be assumed that the "closed" date is the same as the "due" date, that is, that the facility returns to compliance.

Problems may occur using this measure as the automatic calculation cannot avoid including a measure of the timeliness of DEP's reinspection. Many verification reinspections occur following the "due" date and it cannot be determined whether or not the facility was actually in compliance on the "due" date. Further, many extensions of the "due" date are given by telephone and documented in a following letter. These extensions are not currently recorded in FMF. In order to calculate this Measure of Success more precisely, a change in policy regarding updating the "due" date will be required.

Example:

$$\frac{CLOSED \leq DUE}{(CLOSED \leq DUE) + (CLOSED > DUE)} \; X\, 100 = \%\ COMPLIANCE$$

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II.C. Ratio of "severe" violations to all violations [Phase 2]

What does this measure mean?

"Severe" violations of environmental regulations pose a disproportionately greater environmental contaminant loading than "moderate" or "minor" violations. This measure is an indicator of the relative environmental burden posed by the proportion of violations deemed "severe."

Protocol:

When an enforcement action is issued against a facility, the type of enforcement action should be posted to the Facility Enforcement Maintenance function (FENFMNT) of the Facilities Management File (FMF). Possible types of enforcement include Notices of Noncompliance (NON), Administrative Consent Orders (ACO), Administrative Consent Orders with Penalty (ACOP), Penalty Assessment Notices (PAN), and Attorney General referrals (AG). FMF will tabulate the following categories of severity:

Category	Severity	Enforcement Action
A.	Least	NON
B.	Less	ACO
C.	More	ACOP + PAN
D.	Most	AG

FMF will then determine the ratio of each severity category compared to the total number of enforcement actions.

ALTERNATIVELY, the media programs currently use existing, independently determined designations for "severe" including Significant Non Compliers (SNC) in Industrial Waste Water, High Priority Violators (HPV) in Hazardous Waste, and Significant Violators (SV) in Air Quality. These designations are not currently entered into FMF; if entered into FMF in the future they would highlight the most severe violations.

Example:

Not needed. Inspectors will not be calculating this measure. FMF will automatically total the number of entries posted in each category.

II.D. Number of unregulated waste streams identified via inspection action

What does this measure mean?

The number of unregulated waste streams identified at a facility is one indicator of that facility's understanding of or willingness to comply with DEP and EPA regulations as well as an indicator of environmental contaminant loading. This measure will indicate the impact of DEP's outreach activities in affecting the environmental practices of facilities (prior to any inspection or enforcement action at a particular facility) as well as DEP's effectiveness at "levelling the playing field" by identifying and bringing into compliance former "outlaws." Further, this measure is one indicator of the effectiveness of FIRST inspections; single medium inspections did not consistently seek unregulated waste streams.

Unfortunately, the number reported for this measure of success is paradoxical. A small total number of unregulated waste streams found either may be a negative message indicating that FIRST inspectors could be doing a better job of identifying this load on the environment, or that DEP could be doing a better job of targeting facilities which are potentially out of compliance, or may be a positive message indicating that facilities are improving compliance habits, or that the "playing field" is becoming "more level."

Protocol:

With the addition of the Measures of Success Maintenance function (MOSMNT) in the Facilities Management File (FMF), the number of entries in the "volume" Measure of Success category (item II.E., next page) will be totalled and reported.

Note for counting multiple unregistered waste streams at a facility: one or more unregistered Industrial Waste Water unregulated waste stream discharged to the same medium (e.g., two waste streams discharged to groundwater) should be counted as one waste stream because separate permits would not be required for the individual waste streams. Similarly, one or more unregistered Air Quality waste streams or processes (e.g., a degreaser and a boiler), should be counted as one waste stream because separate permits would not be required for each process.

Example:

Not needed. Inspectors will not be calculating this measure. FMF will automatically total the number of entries posted.

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II.E. Volume of waste streams unregulated prior to a performed action
1. waste streams containing TURA listed substances
2. waste streams not containing TURA listed substances

What does this measure mean?

The total volume of unregulated waste streams represents an illegal and controllable environmental burden. The volume of one or more unregulated waste streams containing or consisting of TURA listed substances is a particularly problematic load on the environment. This measure will allow us to calculate the cumulative environmental effects of identifying previously unregulated waste streams in the media programs and returning them to compliance through inspection or enforcement actions.

Protocol:

During inspections, DEP staff estimate the volume of individual unregulated waste streams for each media program. The volumes which represent TURA listed substances are totalled and entered separately from the volumes which represent non-TURA listed substances. Some waste stream volumes can be estimated on-site; others will be estimated with additional information in the office (e.g., with air quality source registration form information).

A "volume unknown" code entry will be required for those waste streams impossible to estimate or for which sufficient data or observations were not obtained on-site. Processes normally permitted or registered based on throughput or some measure other than emissions or releases should be indicated through use of a "volume unknown" code entry. Field staff should make a best, conservative estimate for the volumes of unregulated waste streams projected for the next 12 months (one year).

The following units will be used:
Hazardous Waste: pounds/year
Industrial Waste Water *: gallons/year
TURA nonfilers (who should be filers): pounds/year
Air Quality: pounds/year
Solid Waste **: pounds/year

* discharges to groundwater, sewer discharge, and surface water should be recorded separately

** illegal disposal of solid waste on-site: incinerated or landfilled/buried should be recorded separately

It must be assumed that any unregistered waste stream identified during inspection is brought into compliance through discontinuation or appropriate permitting. When BWP determines the amount of unpermitted activity, it assumes that compliance will be

achieved. Other Measures of Success indicate how that compliance was achieved.

Example:

Ineed Alawya, Inc., was inspected on May 10 and was found to have two industrial waste water streams (one with TURA listed substances at 2,000 gallons/day; one with other wastes at 13,500 gallons/day), an air emissions point (at 35 pounds/day), and a solid waste production stream (at 4,200 pounds/day) which are subject to regulation but not registered or permitted. The plant also has a degreaser which is not permitted, but since degreaser permits are based on throughput, not emissions, this is counted as a "volume unknown". This plant operates 5 days per week, year-round. The inspector enters the following data into FMF:

1. TURA chemicals:

IWW (2,000 gal/day) X (260 days/yr) = 520,000 gal/yr

2. other wastes:

IWW (13,500 gal/day) X (260 days/yr) = 3,510,000 gal/yr
AQ (35 pounds/day) X (260 days/yr) = 9,100 pounds/yr
SW (4,200 pounds/day) X (260 days/yr) = 1,092,000 pounds/yr
AQ one waste stream: volume unknown

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III.A. Mitigated penalties invested in source reduction or pollution prevention

What does this measure mean?

Any penalties which could be levied against a facility for non-compliance but are mitigated due to the facility's efforts toward source reduction or pollution prevention are an investment in future, improved environmental protection on the part of DEP. This measure will allow us to calculate the amount that DEP could have collected but instead returned to facilities for their investment in pollution prevention. It should be noted that these penalties are mitigated due to the facility's commitment to conduct pollution prevention activities on a schedule to which DEP and the facility have agreed.

Protocol:

Penalties are currently determined using the Civil Administrative Penalties worksheet (310 CMR 5.00) based upon the individual media programs' penalty "buckets" sheets. Either the "Total Penalty Amount" (line 8a) or the "Maximum Penalty Amount" (line 9a), if it is less than the "Total Penalty Amount," is assessed against the facility. DEP's agreement to mitigate penalties for the facility's commitment to conduct pollution prevention activities is accomplished through Consent Order procedures.

Using the Measures of Success Maintenance function (MOSMNT) in the Facilities Management File (FMF), the penalties actually assessed against the facility as stated in the Consent Order are subtracted from the total penalties possible against the facility as stated in the Civil Administrative Penalties worksheet. Due to the penalty calculation procedure which takes into account many factors when determining the final penalty amount, it must be assumed that there was no penalty mitigation for other reasons. This assumption should not affect the accuracy of this Measure of Success as penalty mitigations for other reasons are documented in determining the final penalty amount (either line 8a or 9a from the Civil Administrative Penalties worksheet) assessed against the facility. The penalty amount mitigated for pollution prevention is determined separately during the Consent Order procedure.

Example:
How N. Fortunate Co. was found to be out of compliance in several areas during an inspection. Using the Civil Administrative Penalties worksheet, DEP staff calculated that the facility could be assessed a $25,000 penalty. Through negotiations, How N. Fortunate commits to conducting some specific pollution prevention

activities; DEP reduces the penalty to $15,000. In FMF, $10,000 is entered for mitigated penalties for pollution prevention.

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Measure III.B. Money projected to be saved by facilities due to P2 [Phase 2]

What does this measure mean?

Protocol:

Example:

Measure III.C. Permits no longer needed due to P2 [Phase 2]

What does this measure mean?

Protocol:

Example:

IV.A. Penalties assessed

What does this measure mean?

The penalties assessed against a facility are one measure of the severity of the contaminant burden that facility potentially or actually places on the environment. Additionally, facilities which attempt to avoid environmental regulation place themselves at a market advantage compared to facilities which incur the costs of compliance. This measure will allow us to calculate the dollar value of the environmental burden's severity, and to estimate the "levelness" of the "playing field" in any industry.

Protocol:

The penalties assessed against a facility are recorded directly in the Facilities Management File (FMF) database.

Example:

Not required. Inspectors will not be calculating this measure but simply entering the value.

IV.B. Penalties collected

What does this measure mean?

The penalties collected from a facility indicate how effectively DEP collects the penalties it assess, and provide a "snapshot" of the incoming revenues including the effects of any payment plans.

Protocol:

The penalties collected from a facility are recorded in the BARS database. No actions in FMF are required. BARS will be online for this in September, 1995.

Example:

Not required. Inspectors will not be calculating this measure. BARS will automatically total this value.

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IV.C. New annual compliance fees to be paid by "outlaws" brought into the system

What does this measure mean?

Facilities which were formerly "outlaws," either unwittingly or intentionally, avoided the direct costs of compliance in the form of fees and the indirect costs of compliance in the form of pollution controls, and placed themselves at a market advantage compared to facilities which incur these costs of compliance. New annual compliance fees paid by "outlaws" represent a indication of DEP's ability to identify and bring "outlaws" into the system, to affect a particular industry or geographic region, and to "level the playing field" for other facilities in that industry or geographic region.

Protocol:

This measure is applicable when "outlaws" decide that compliance includes "coming into the system" (for example, through the permitting process) rather than some other option (for example, source reduction activities which eliminate the need for a permit). Enforcement lead staff should project any new annual compliance fees determined to be required from a facility over the next 12 months (one year) and enter the total into the Measures of Success Maintenance function (MOSMNT) in the Facilities Management File (FMF).

Compliance fees due should not be included in the penalties assessed in Measure of Success item IV.A.

Example:

Obscure, Inc., has inadvertently or intentionally failed to register its Stage II air emissions sources and also failed to register as a very small quantity generator (VSQG) of hazardous wastes (spent mineral spirits from two Safety Kleen units). There are no other violations of annual permitting requirements. The annual compliance fees for these two programs (Air Quality and Hazardous Waste) are added together to obtain the total new annual compliance fees to be paid by this former "outlaw."